

Supplementary information for

Concise assembly of ethynyl-6,8-dioxabicyclo[3.2.1]octanes from acetylenes and ketones

Elena Yu. Schmidt, Ivan A. Bidusenko, Nadezhda I. Protsuk, Igor A. Ushakov and Boris A. Trofimov*

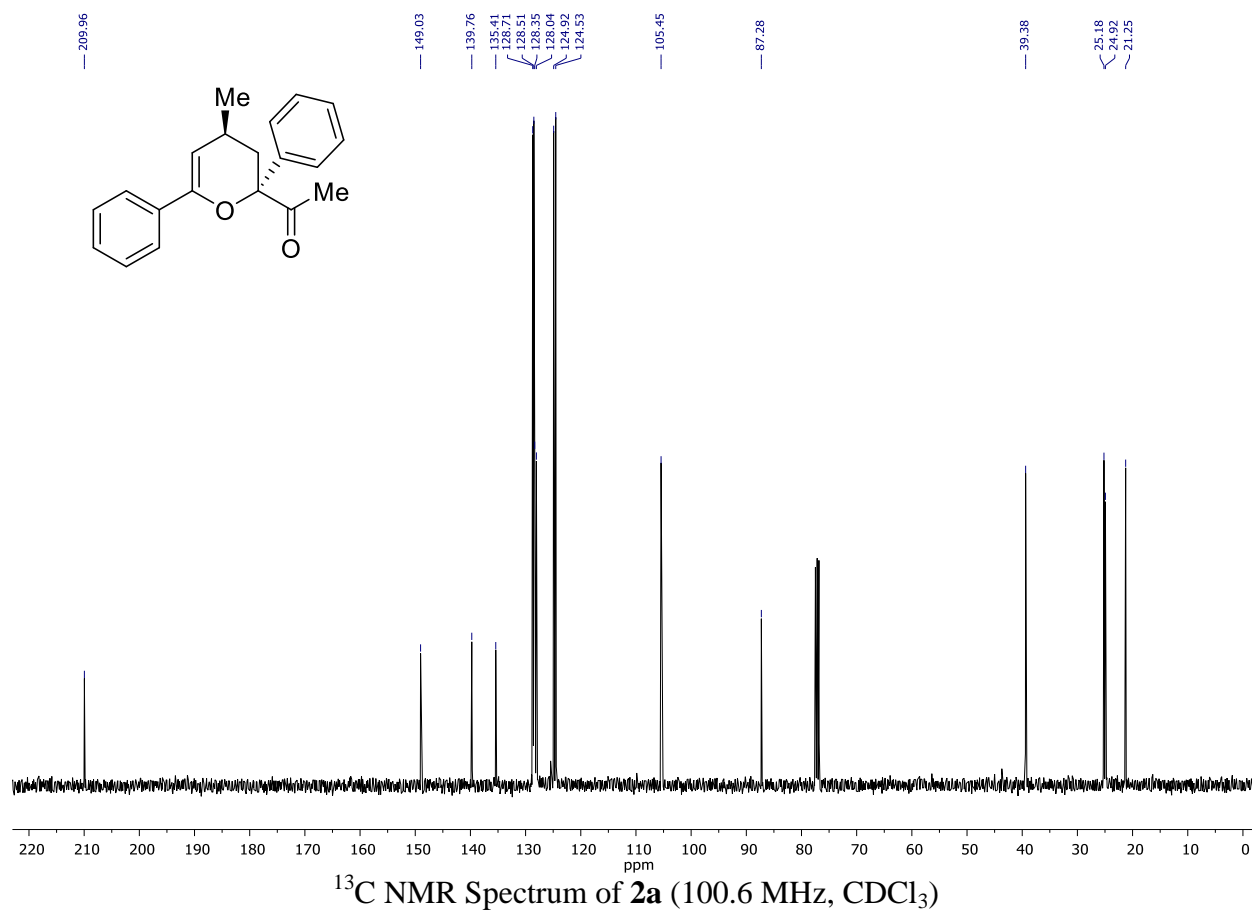
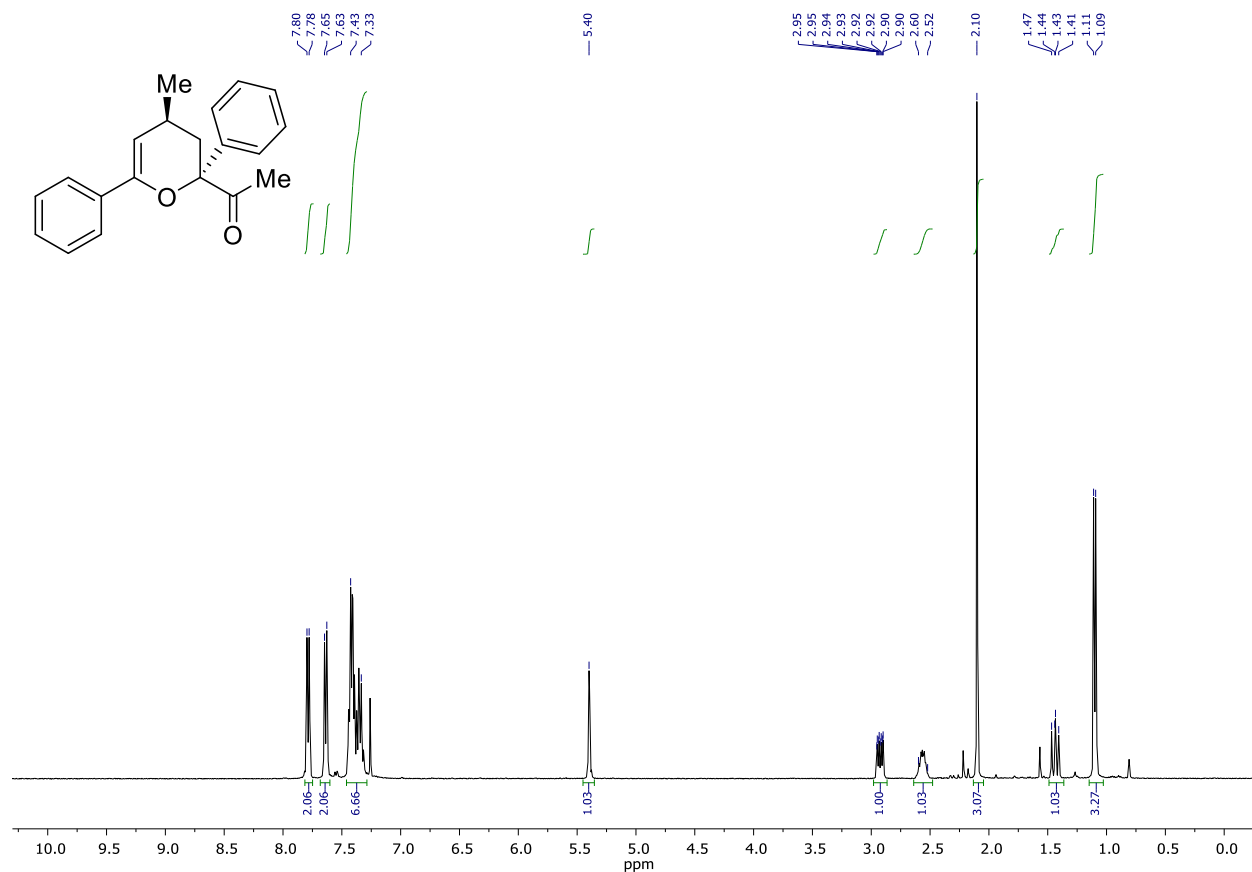
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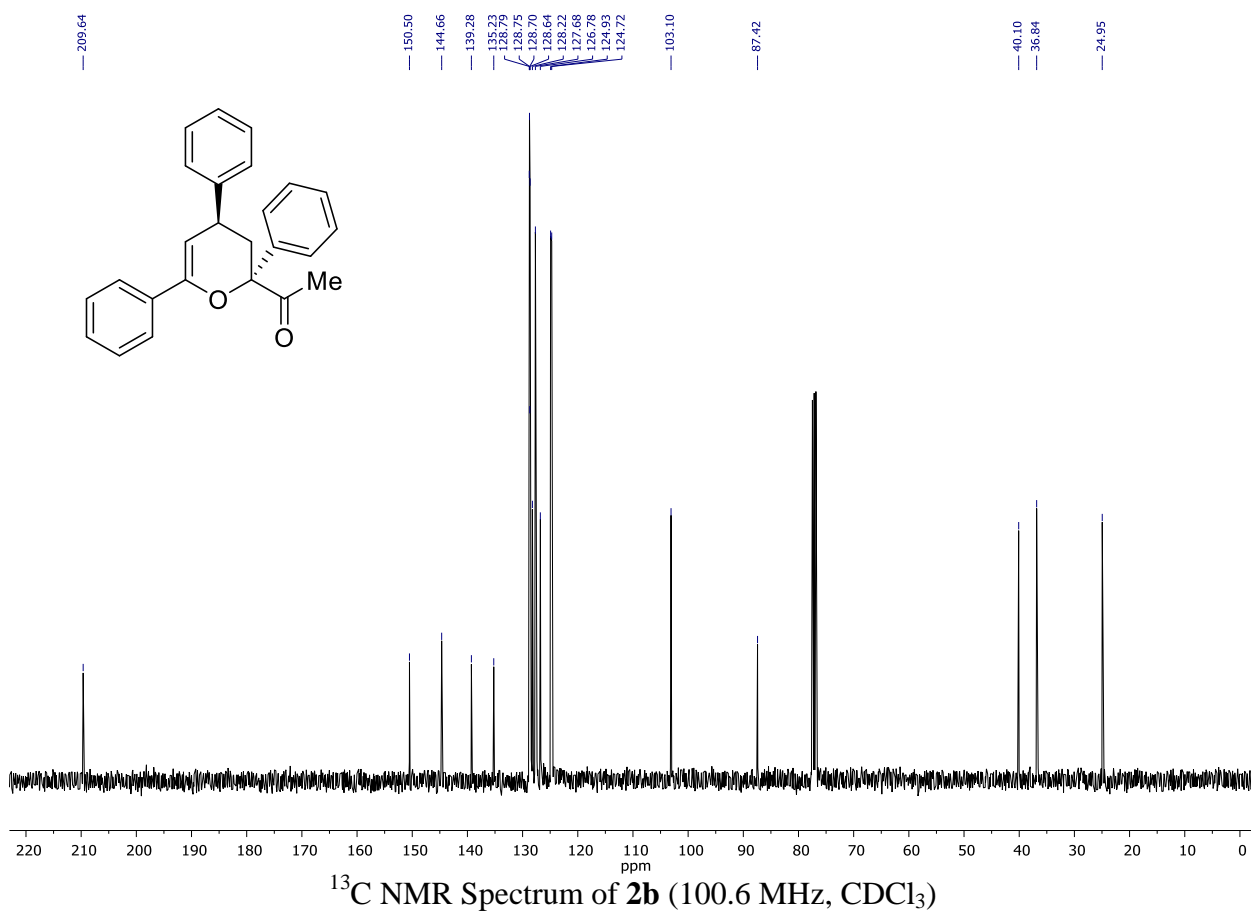
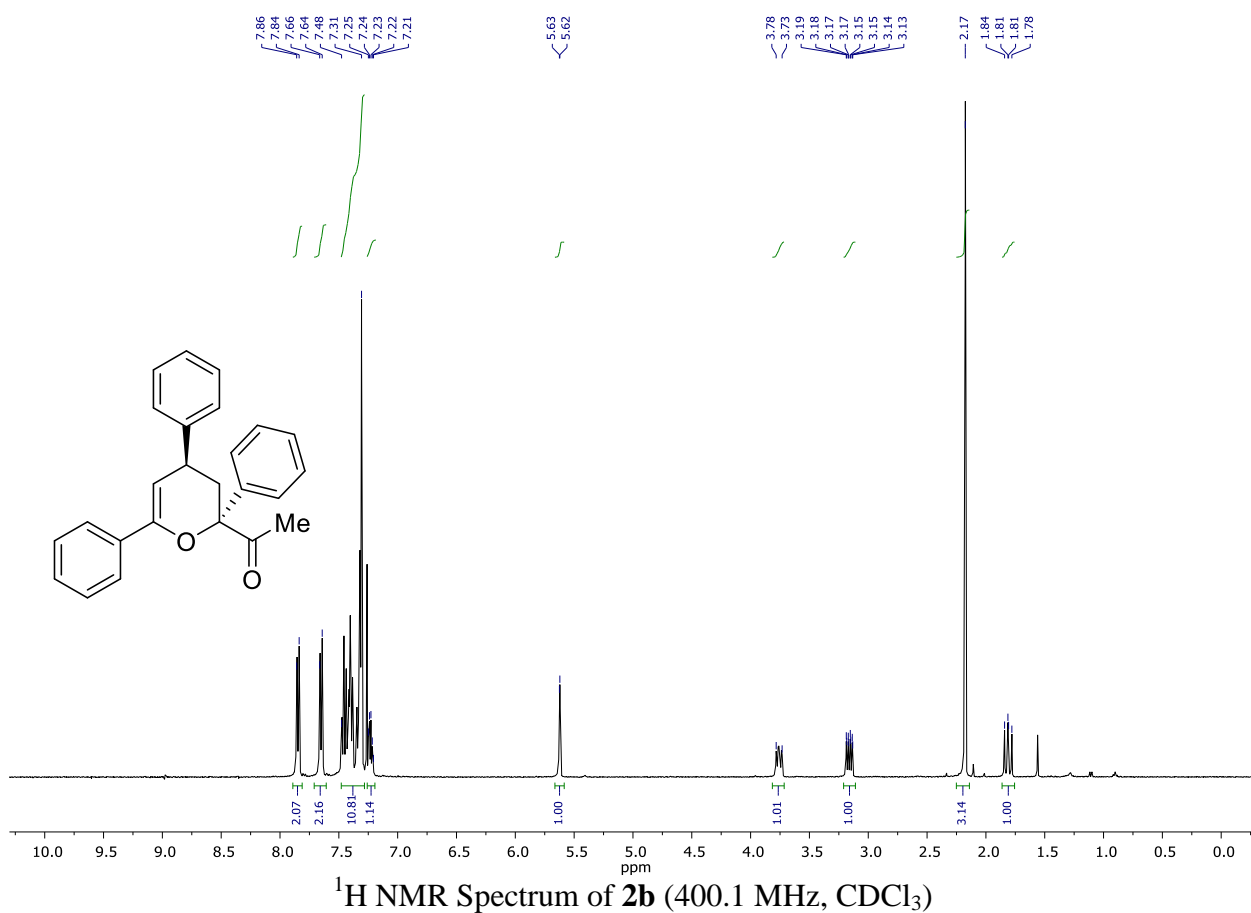
*Corresponding authors: boris_trofimov@irioch.irk.ru

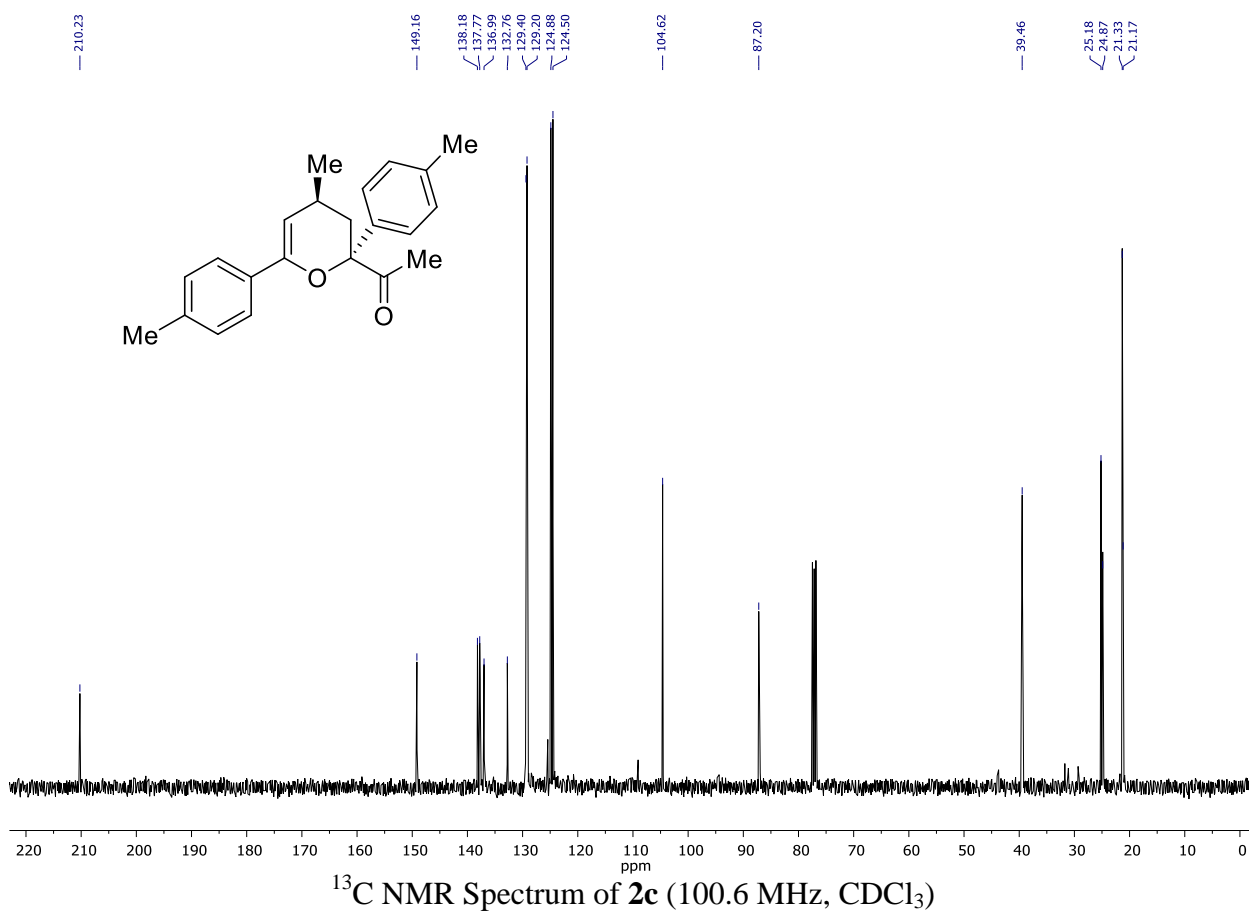
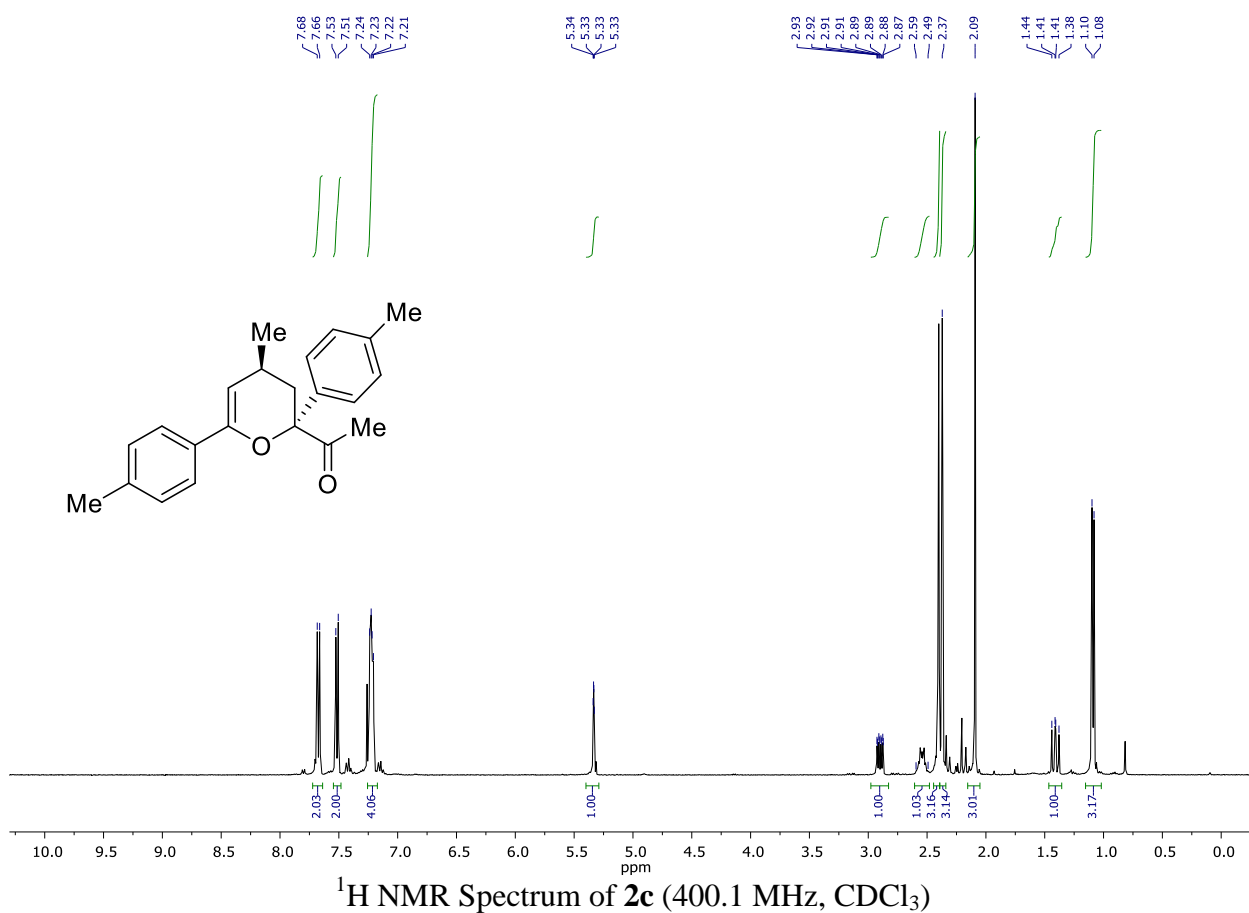
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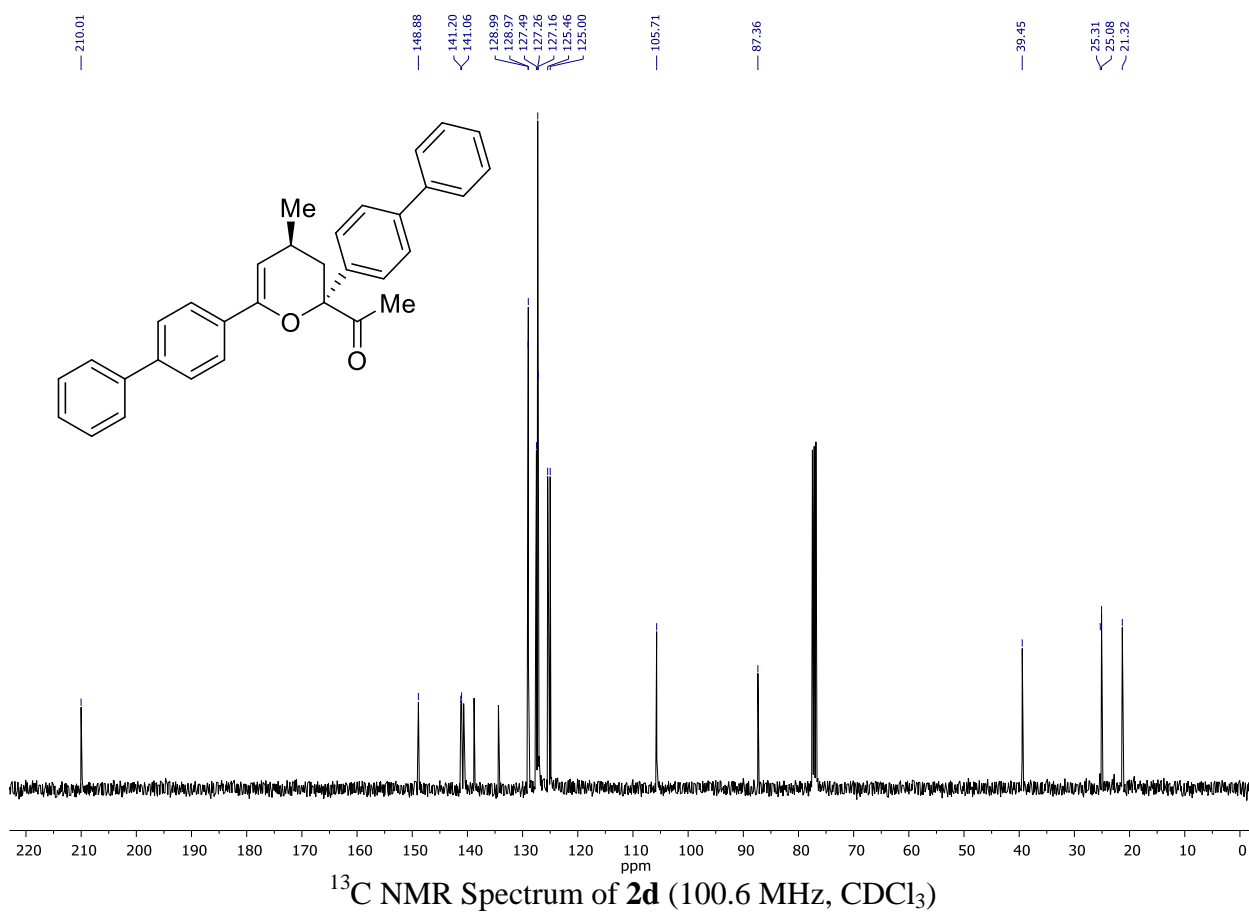
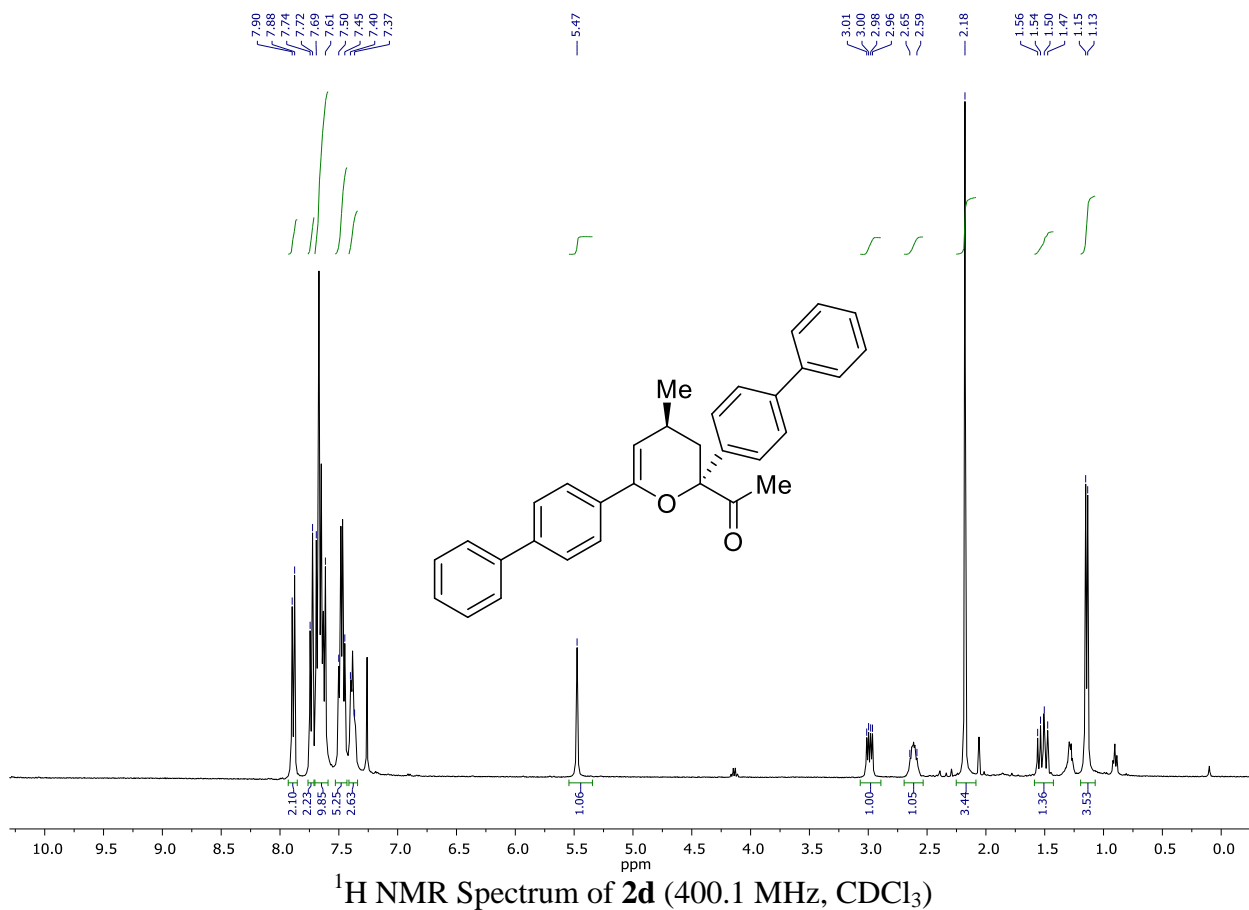
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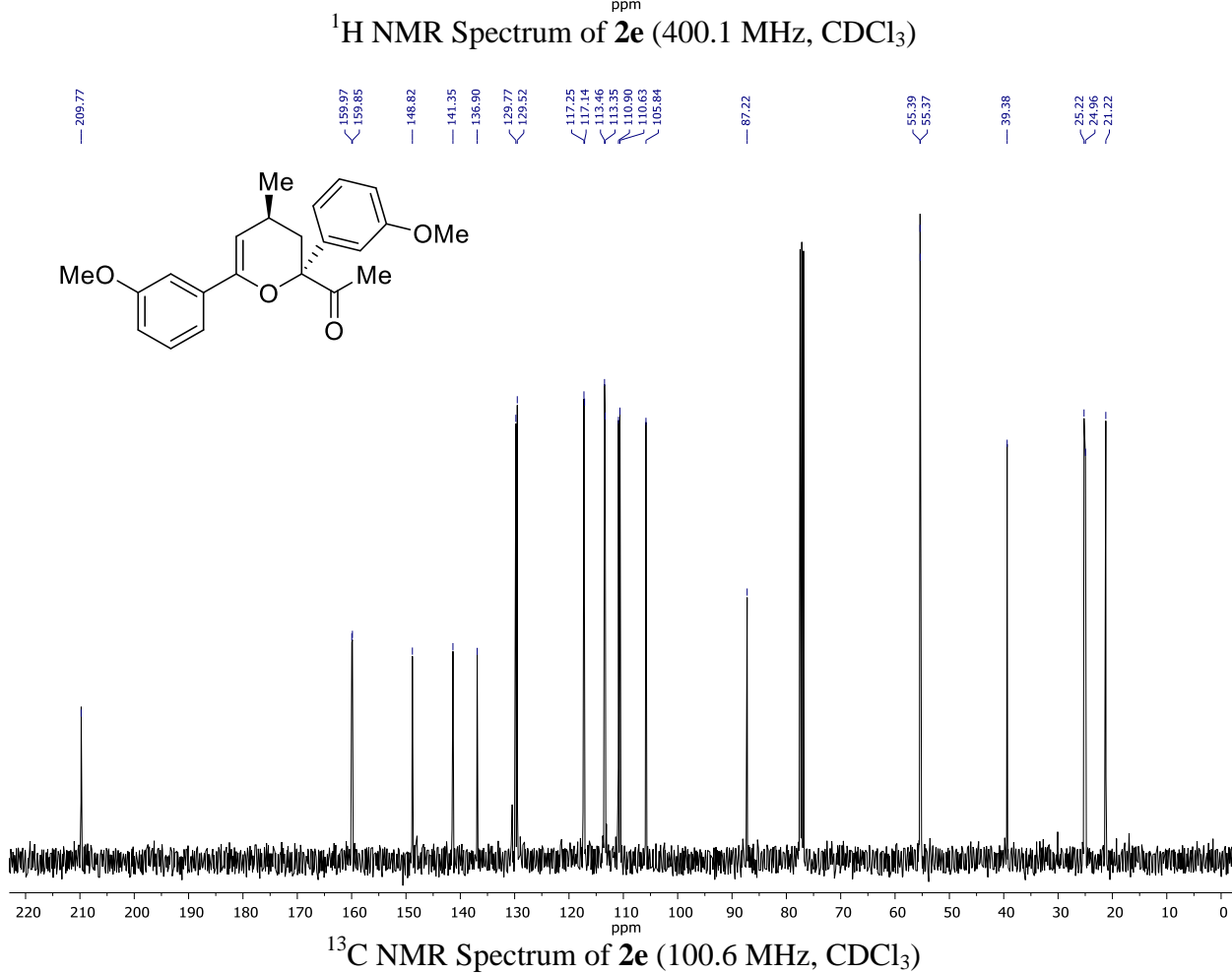
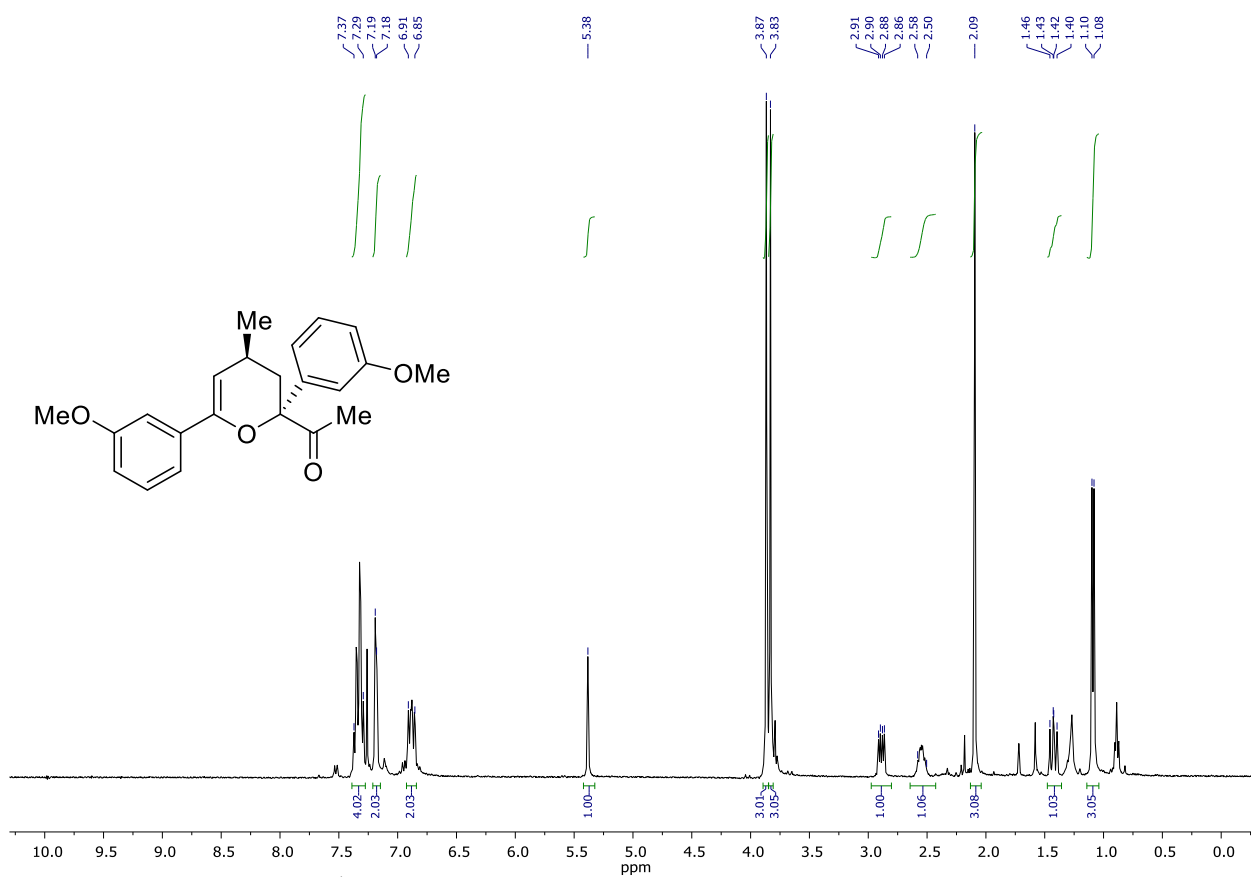
^1H and ^{13}C Spectra of 2-acetyl-3,4-dihydropyrans **2**

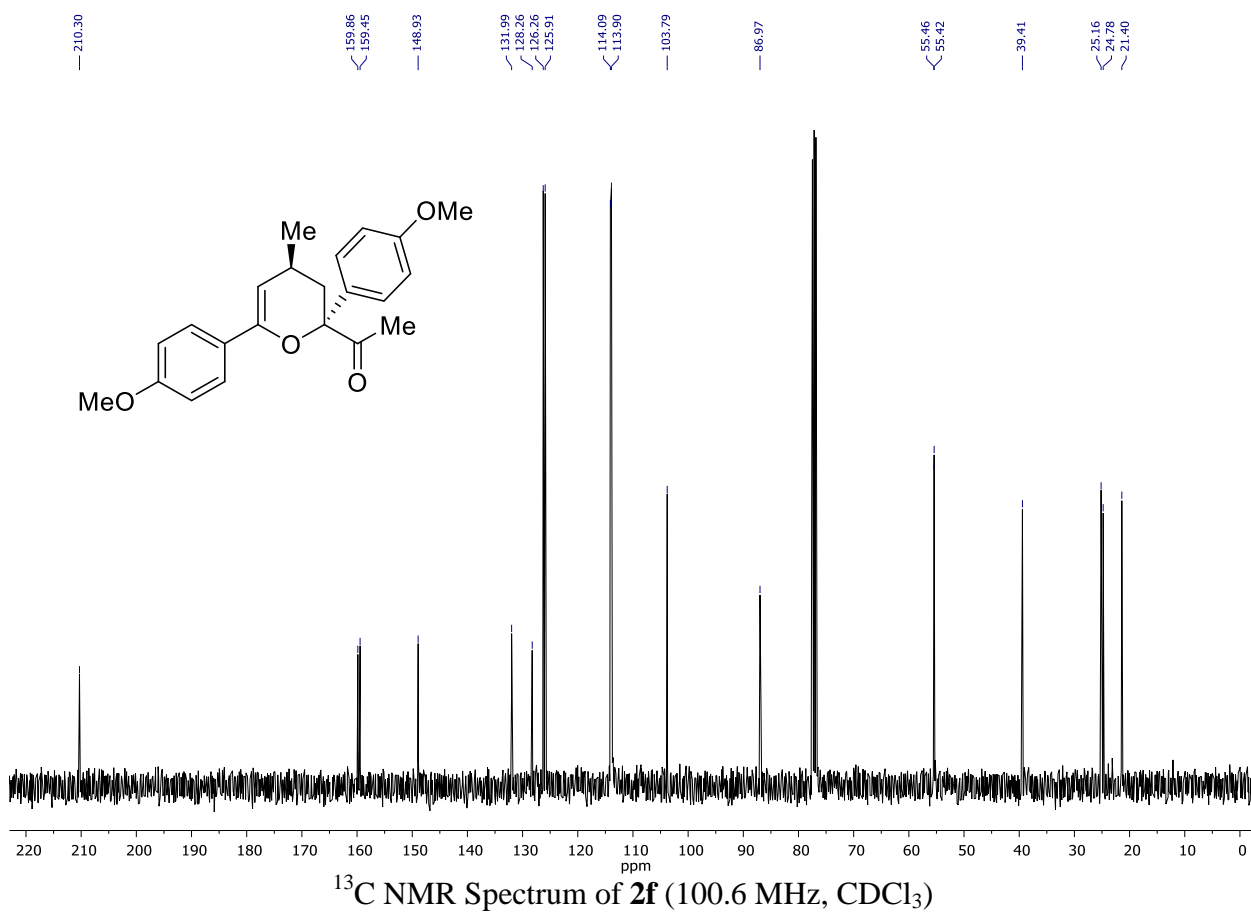
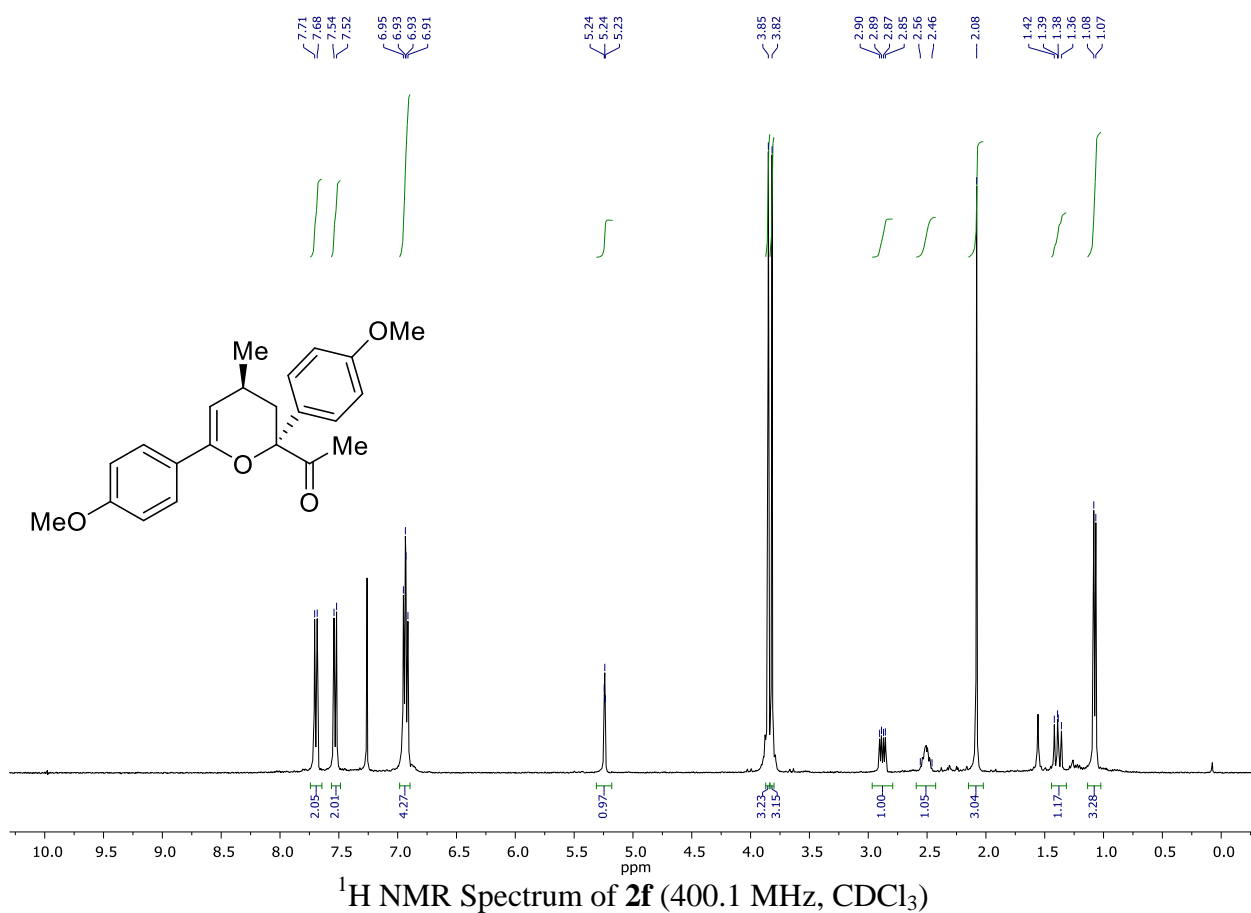


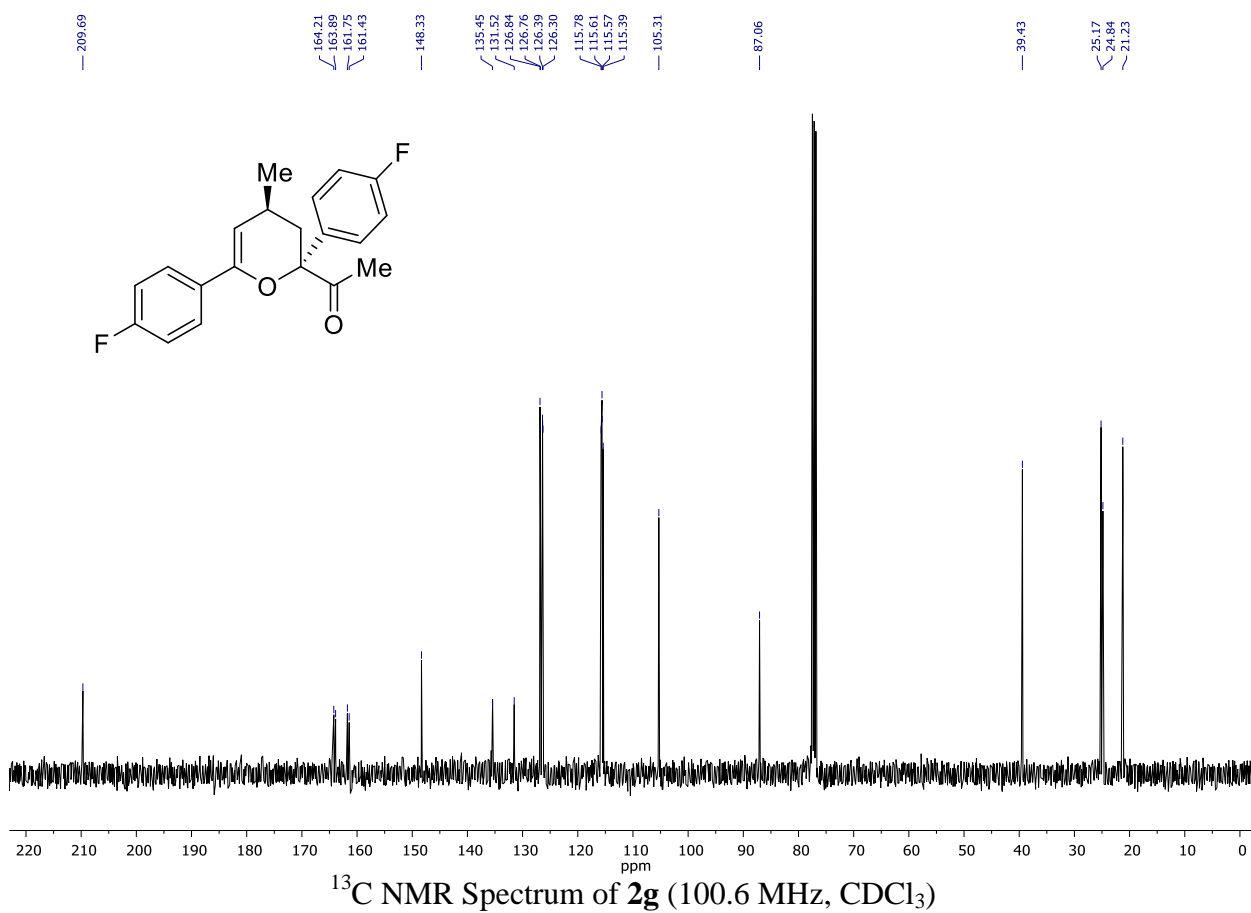
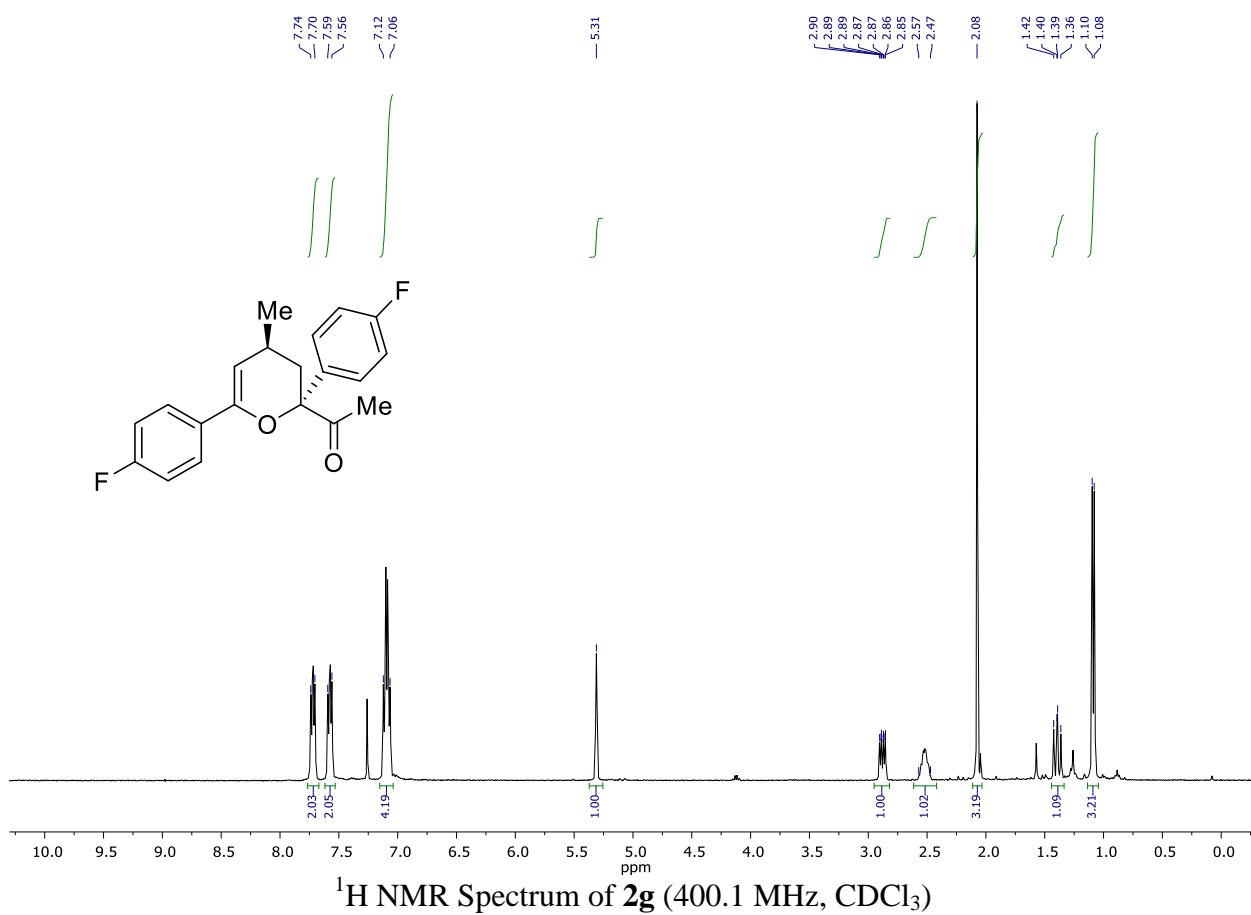


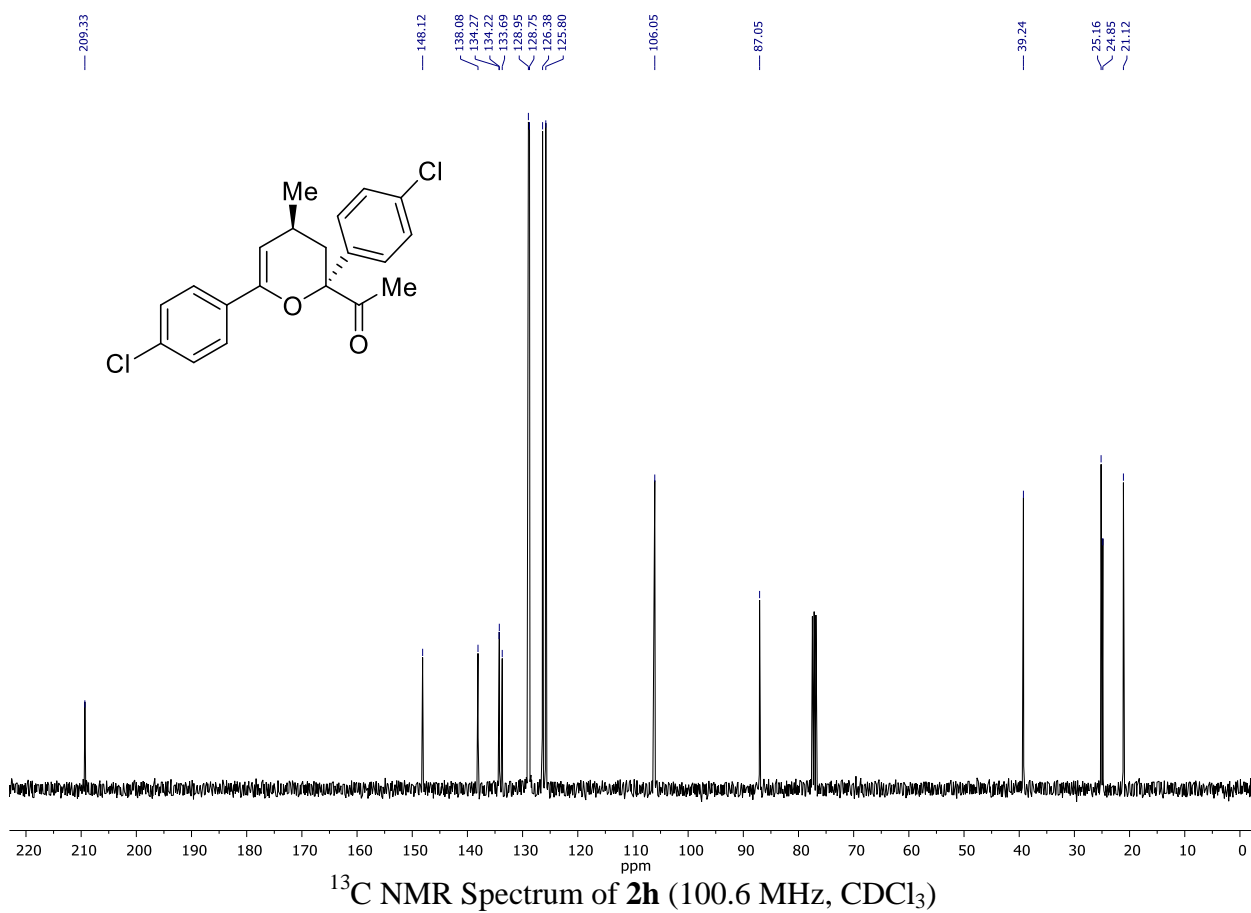
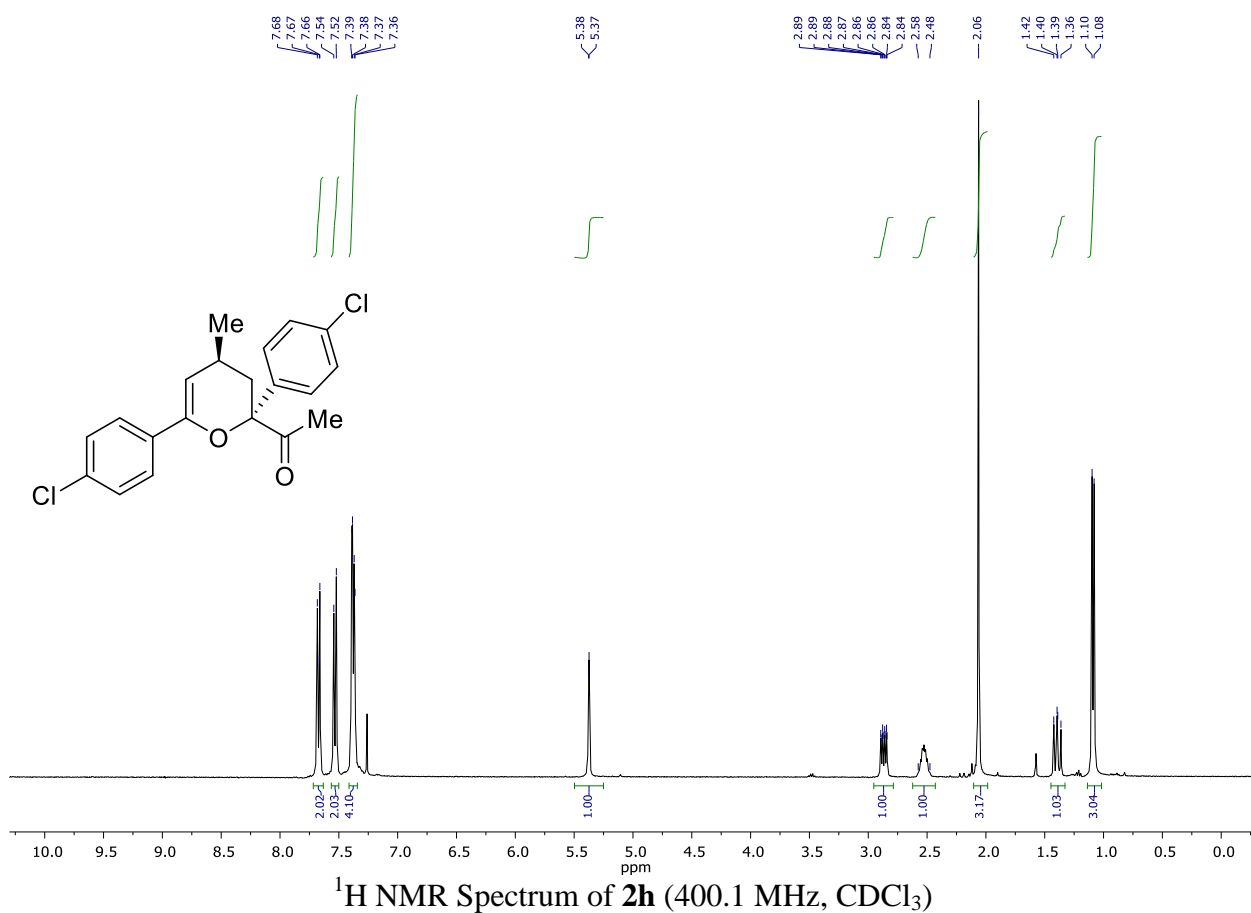


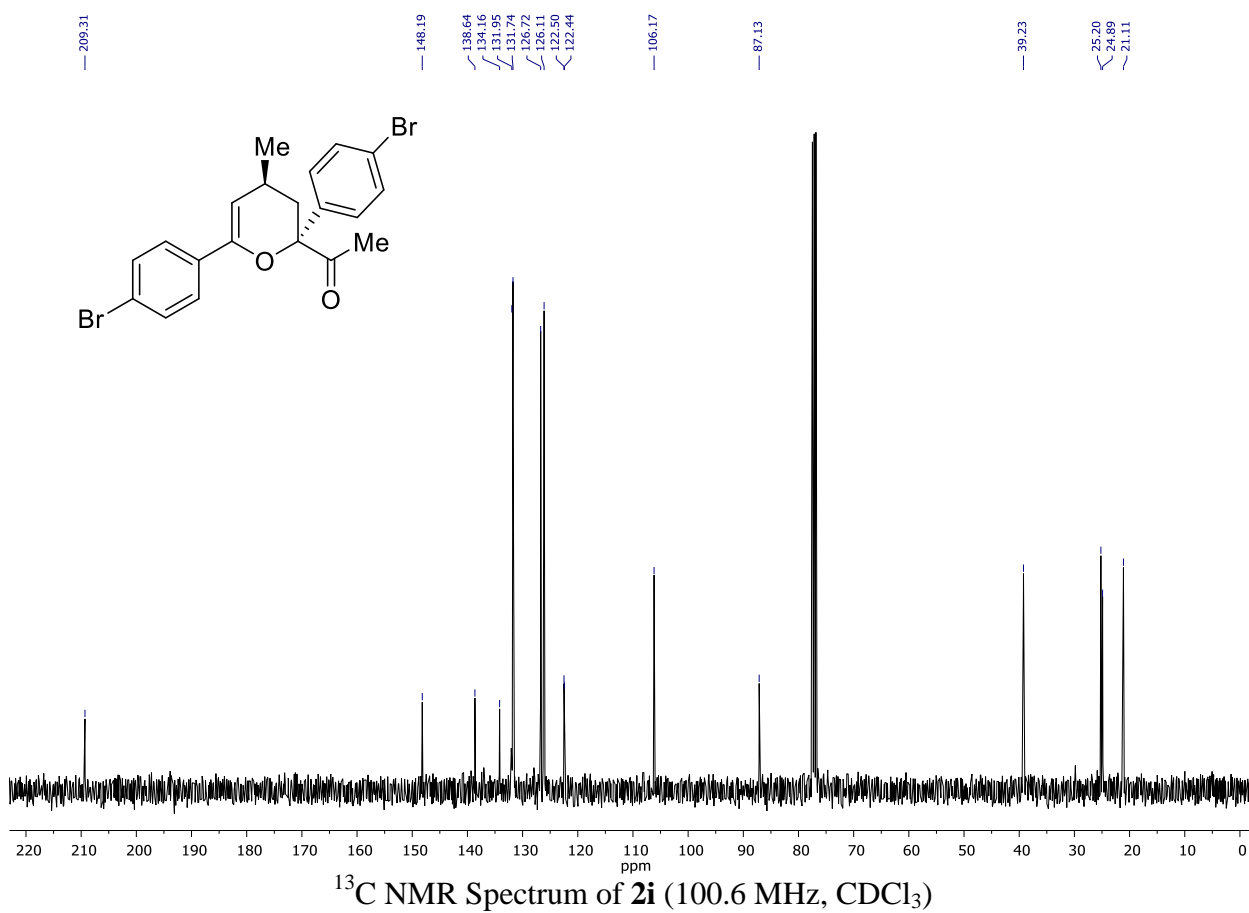
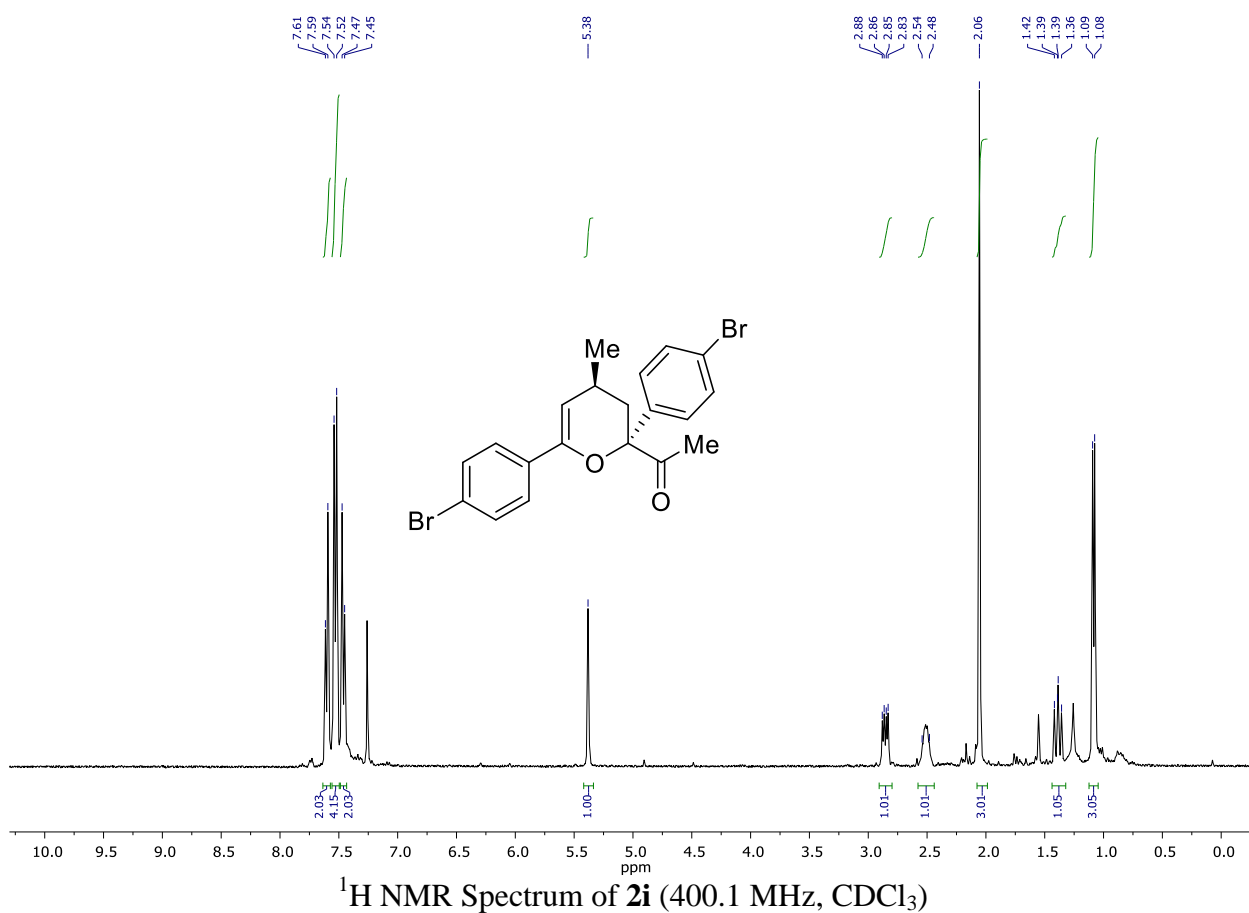


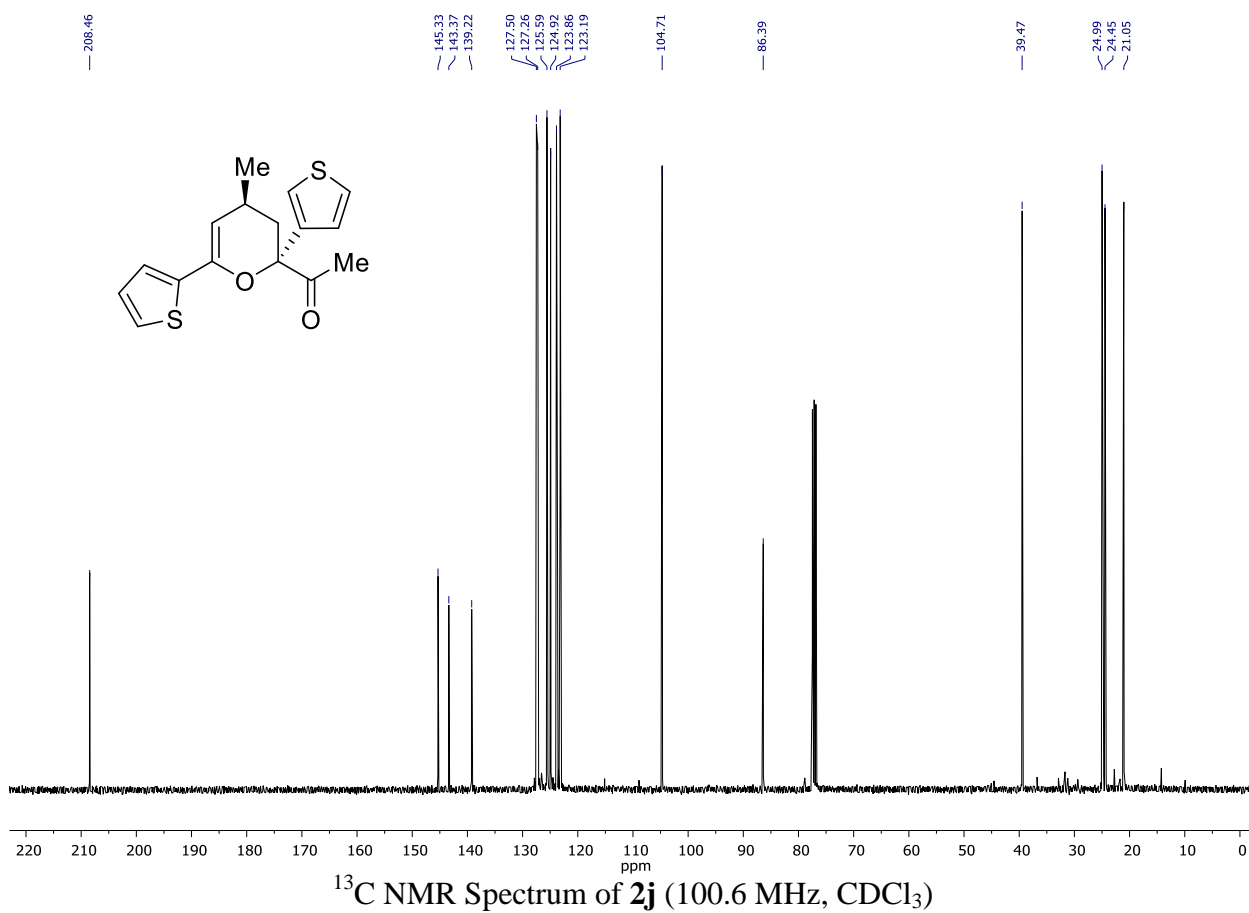
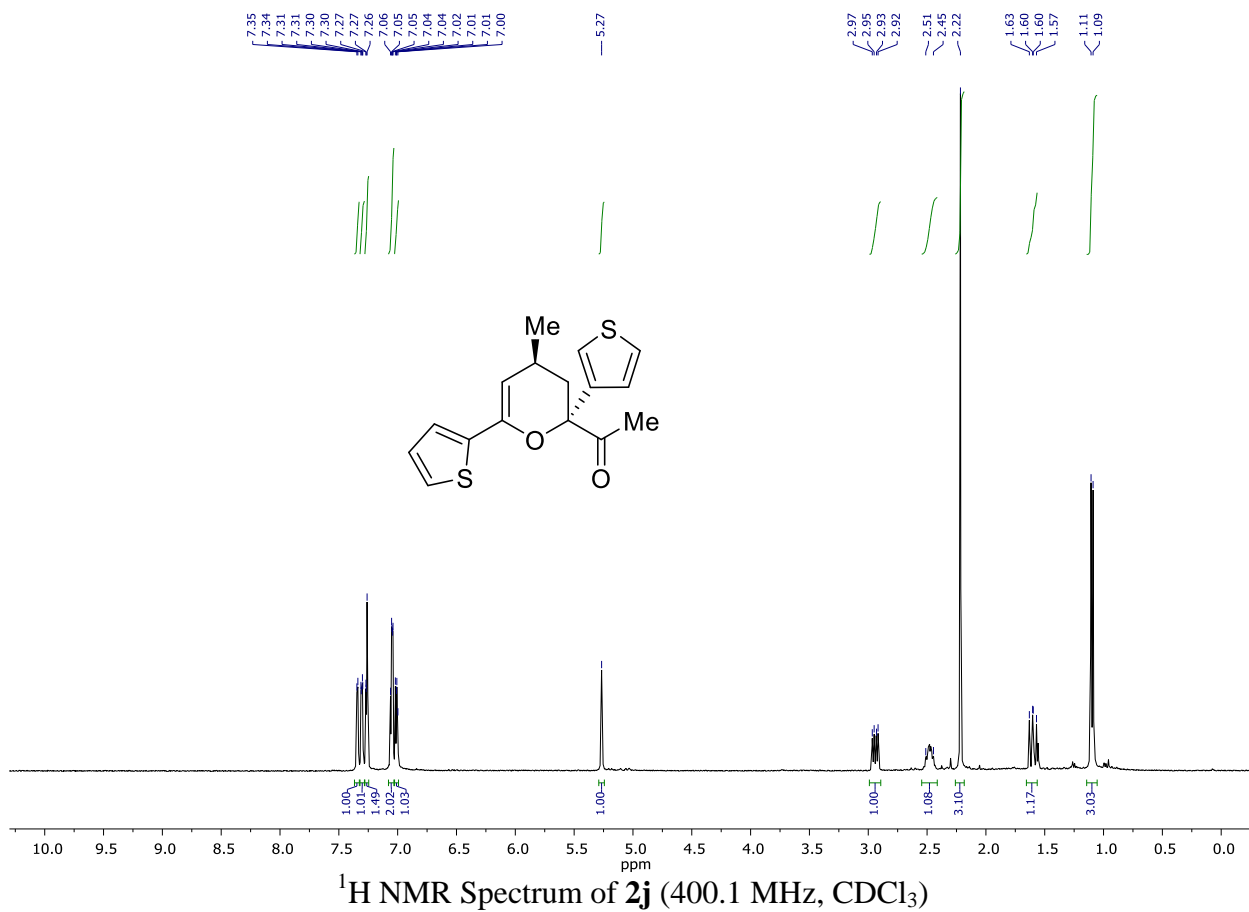


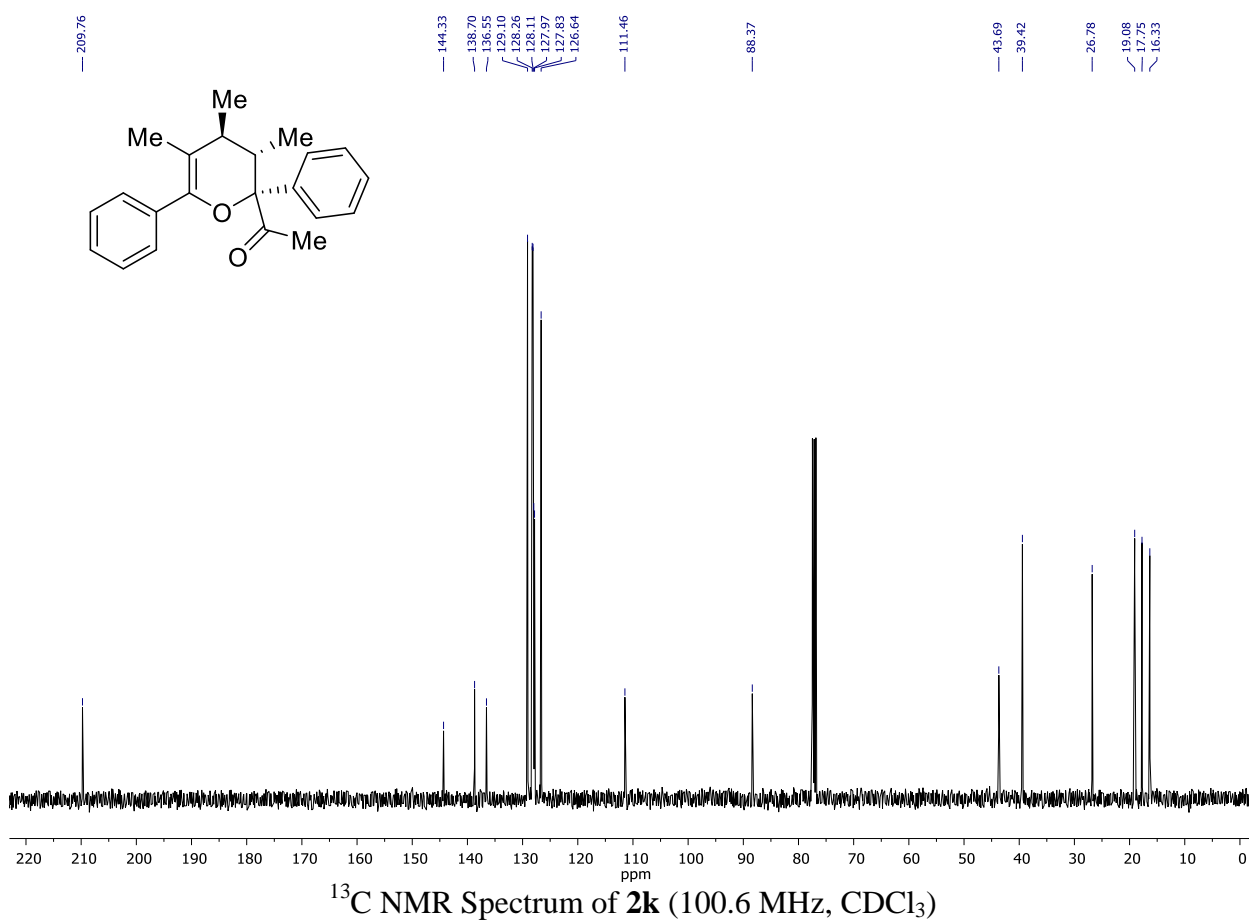
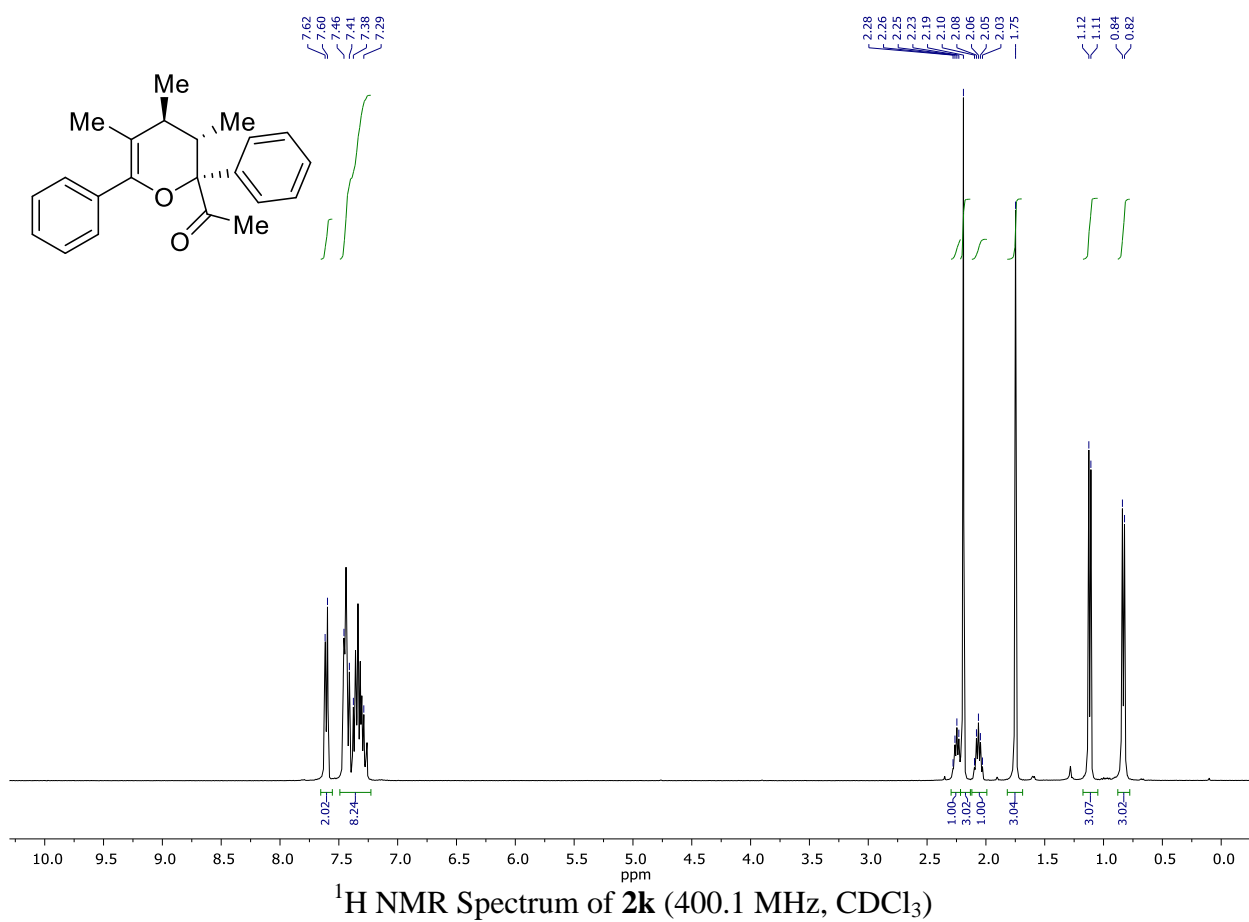




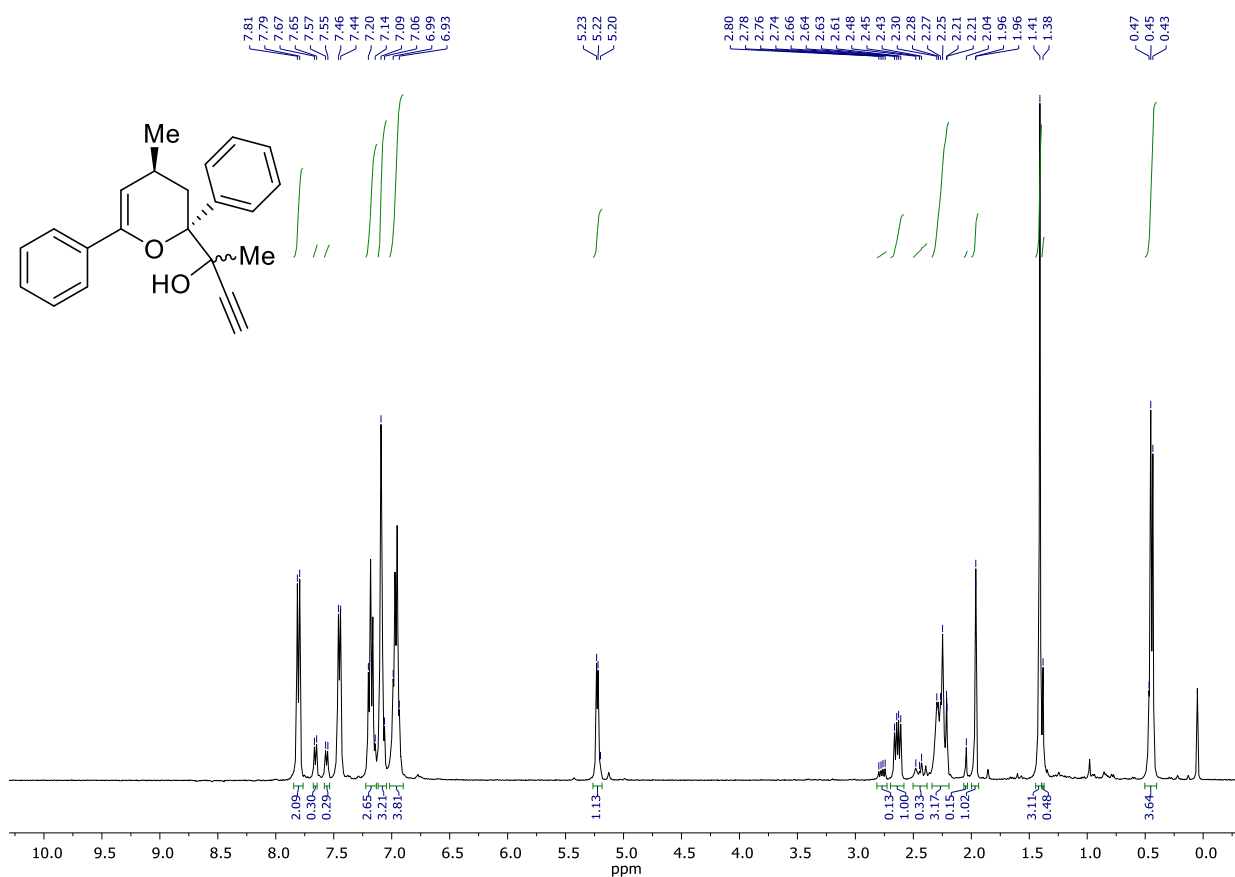




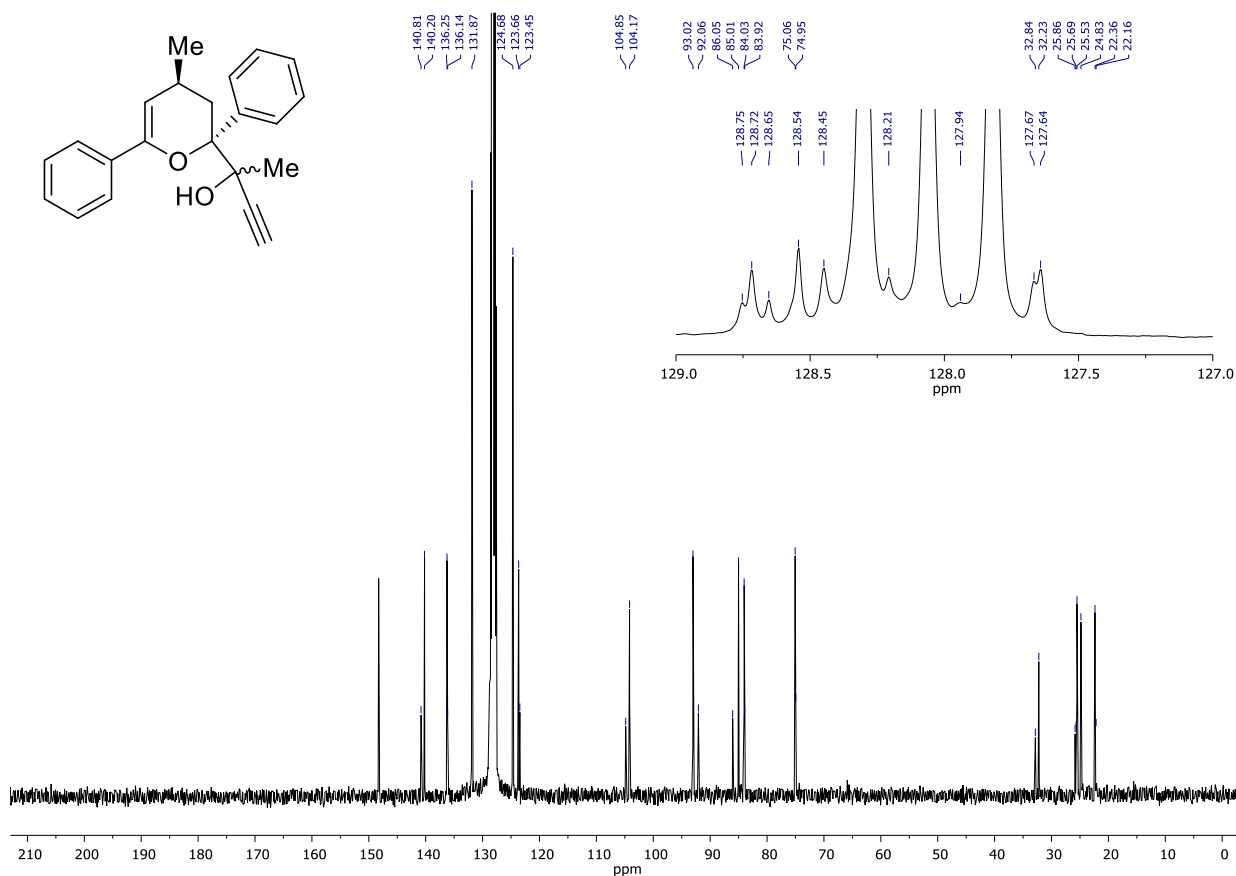




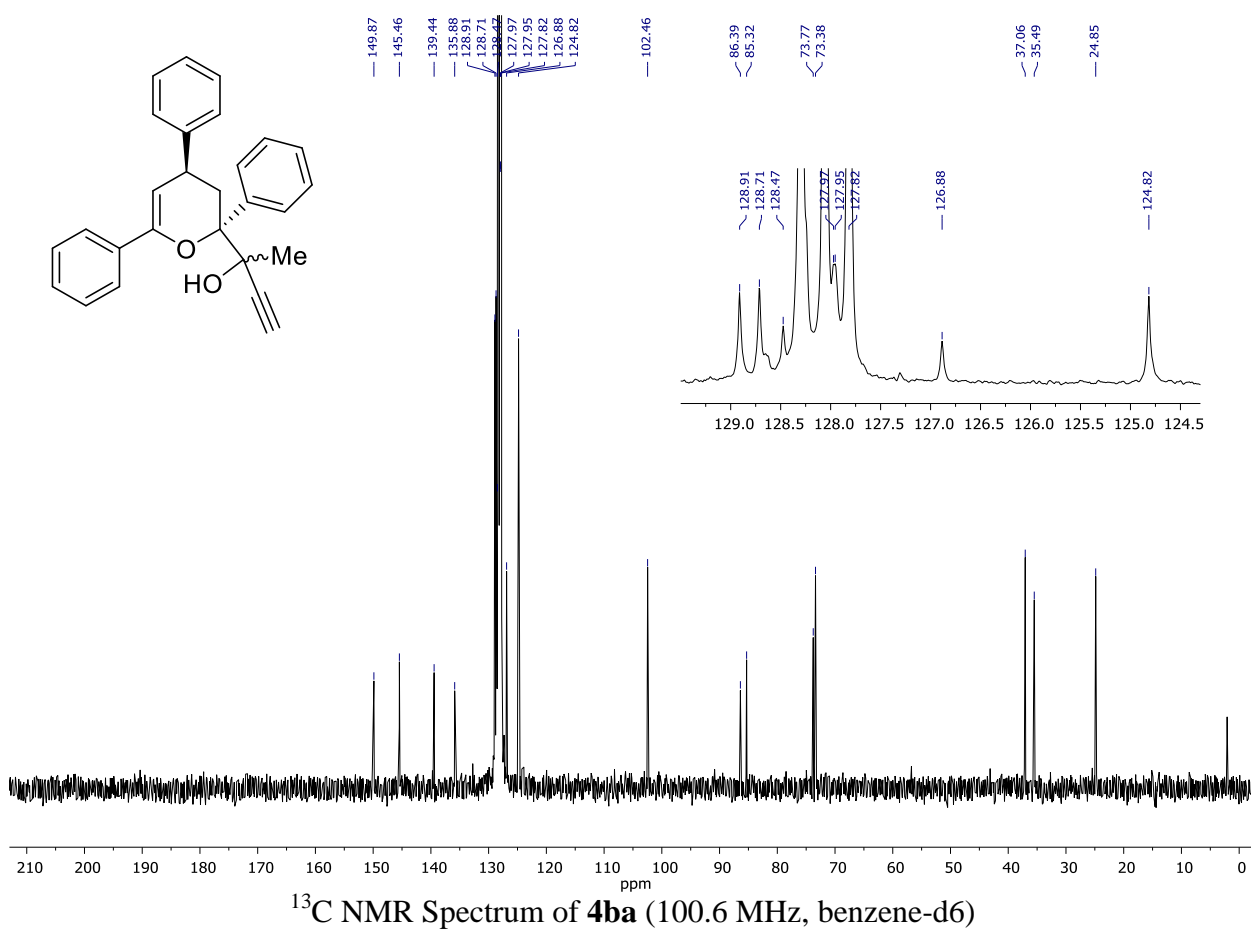
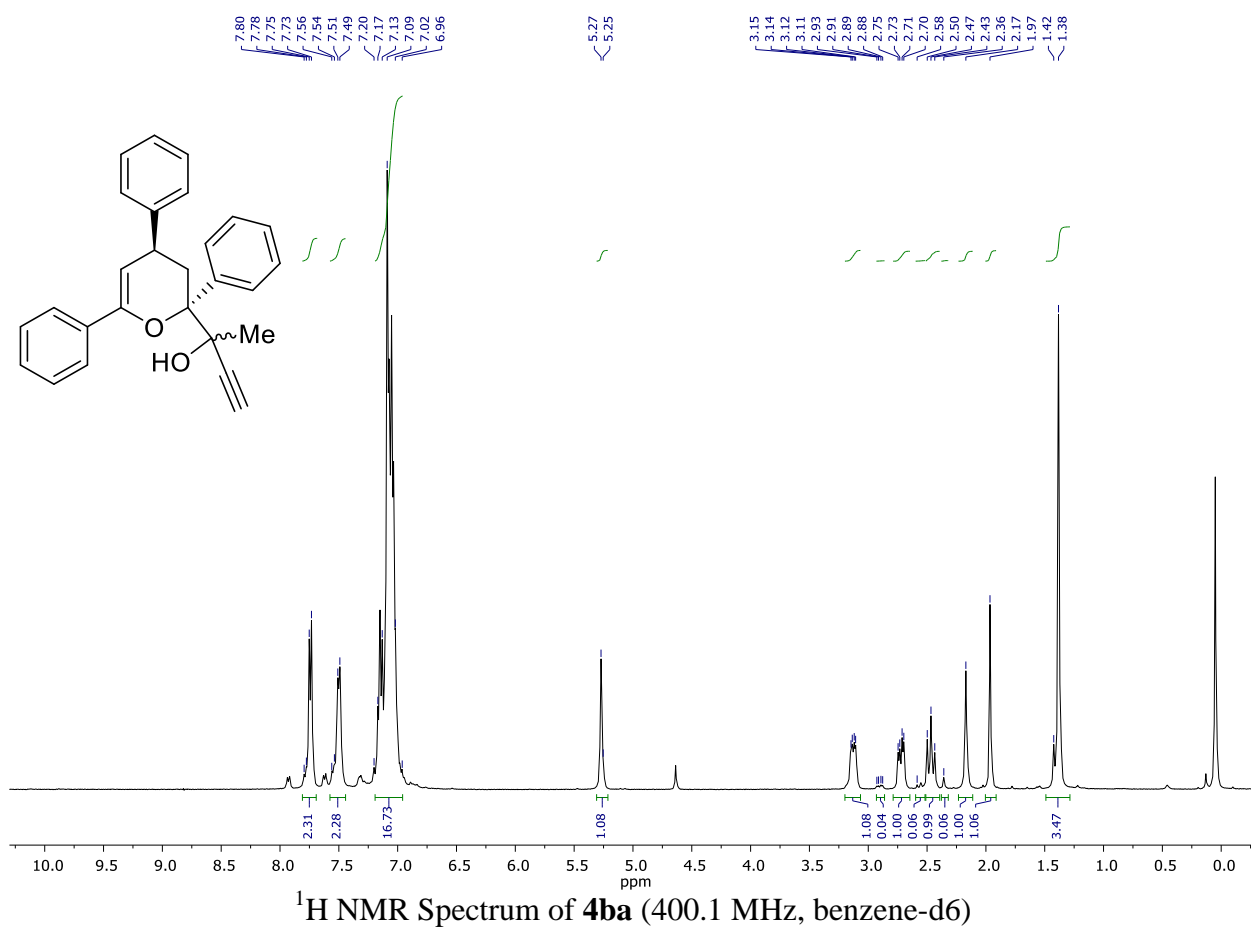
^1H and ^{13}C Spectra of acetylenic alcohol **4**

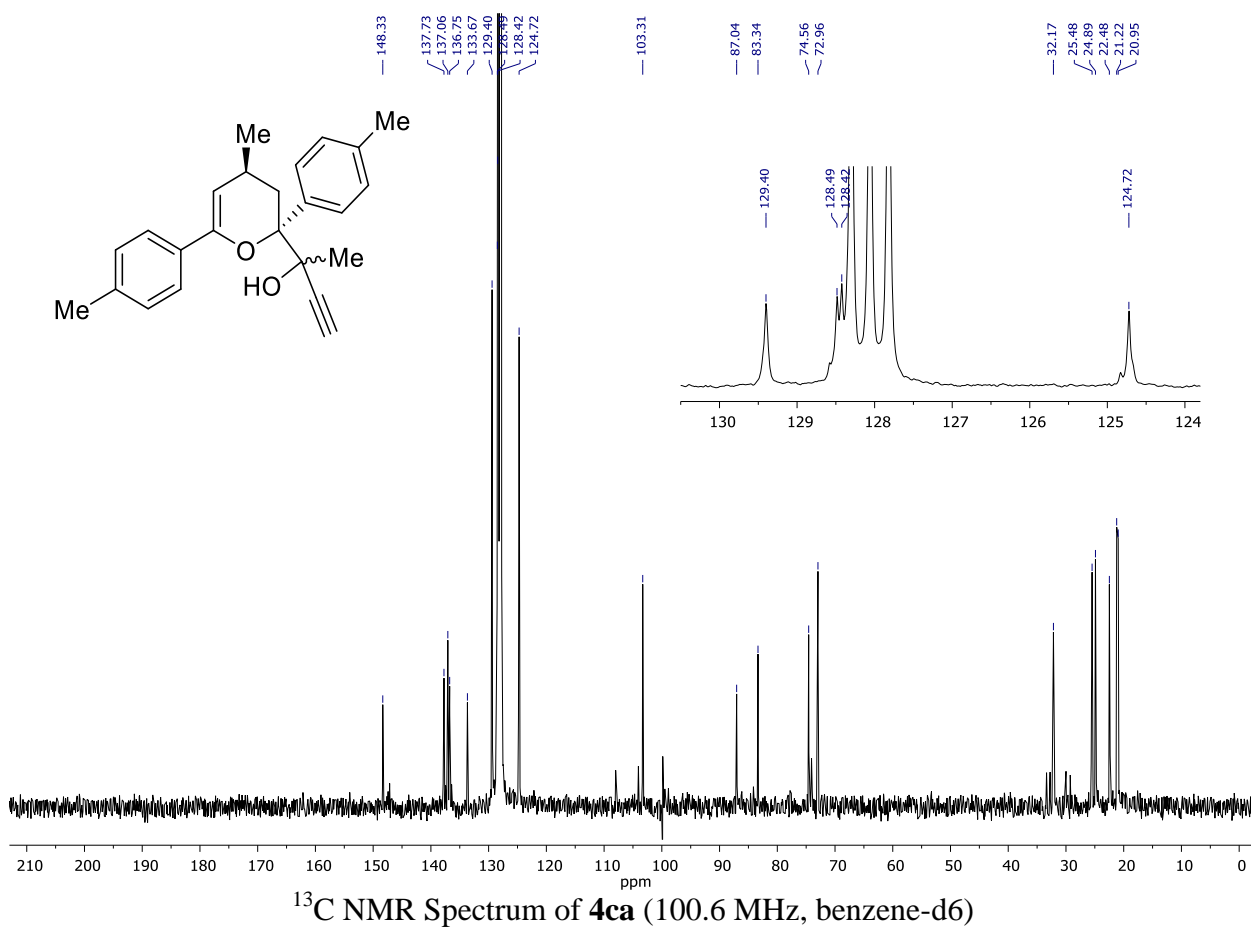
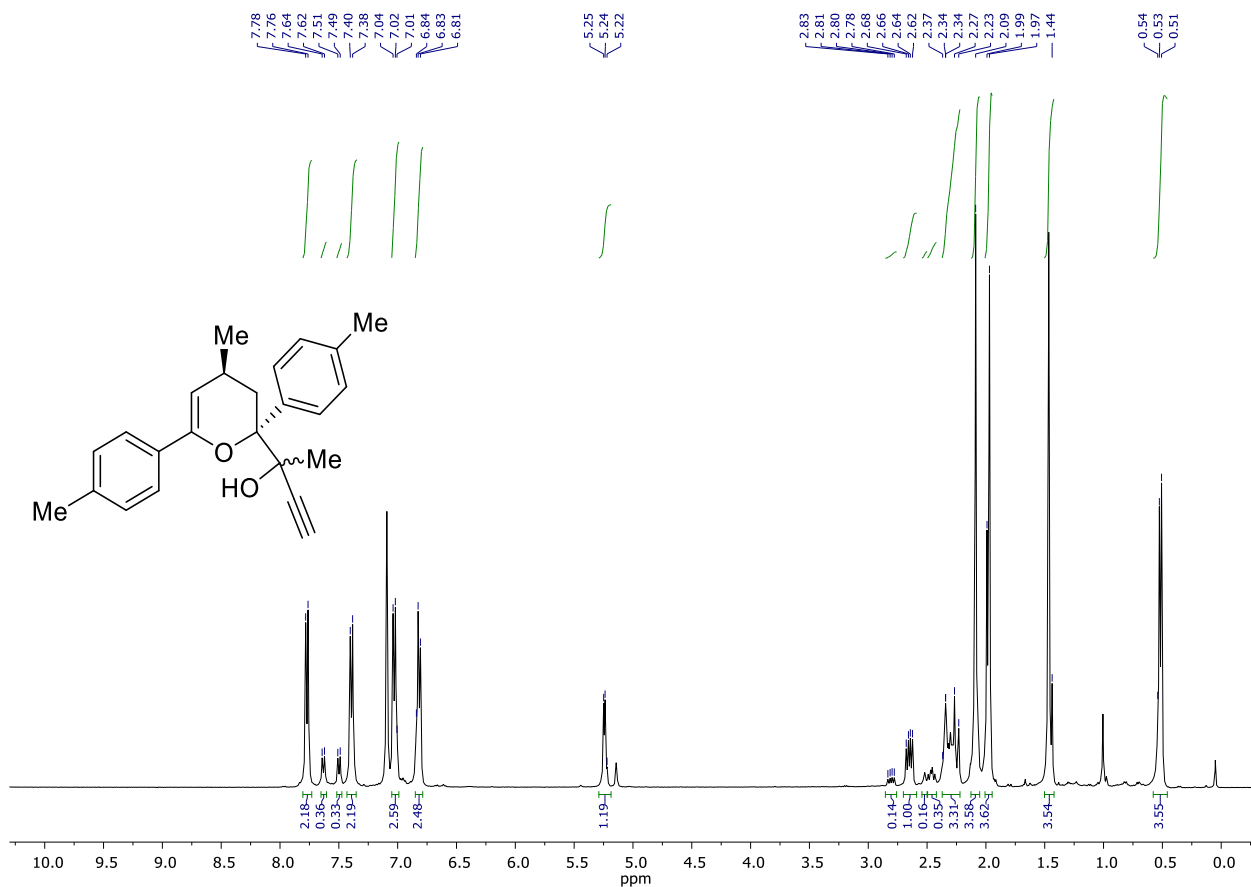


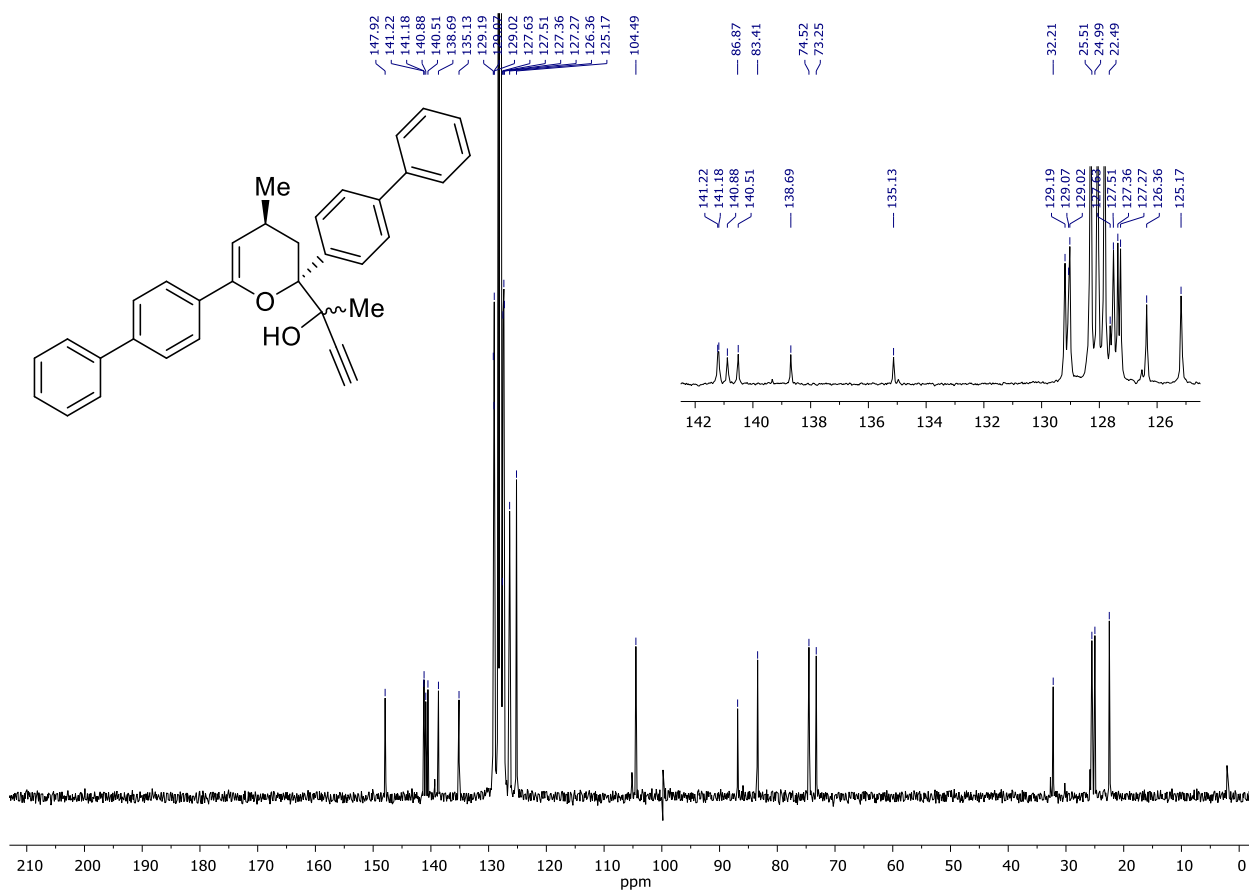
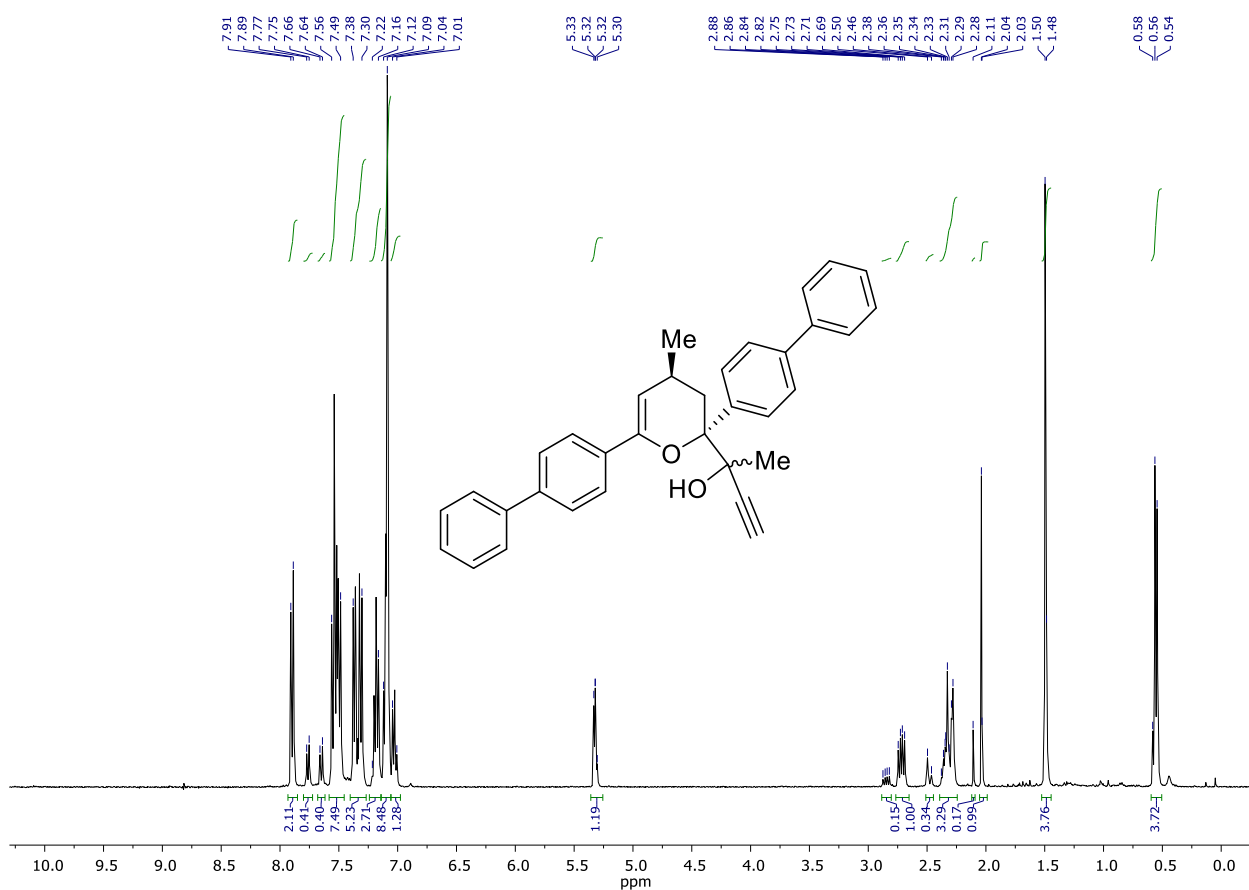
^1H NMR Spectrum of **4aa** (400.1 MHz, benzene- d_6)

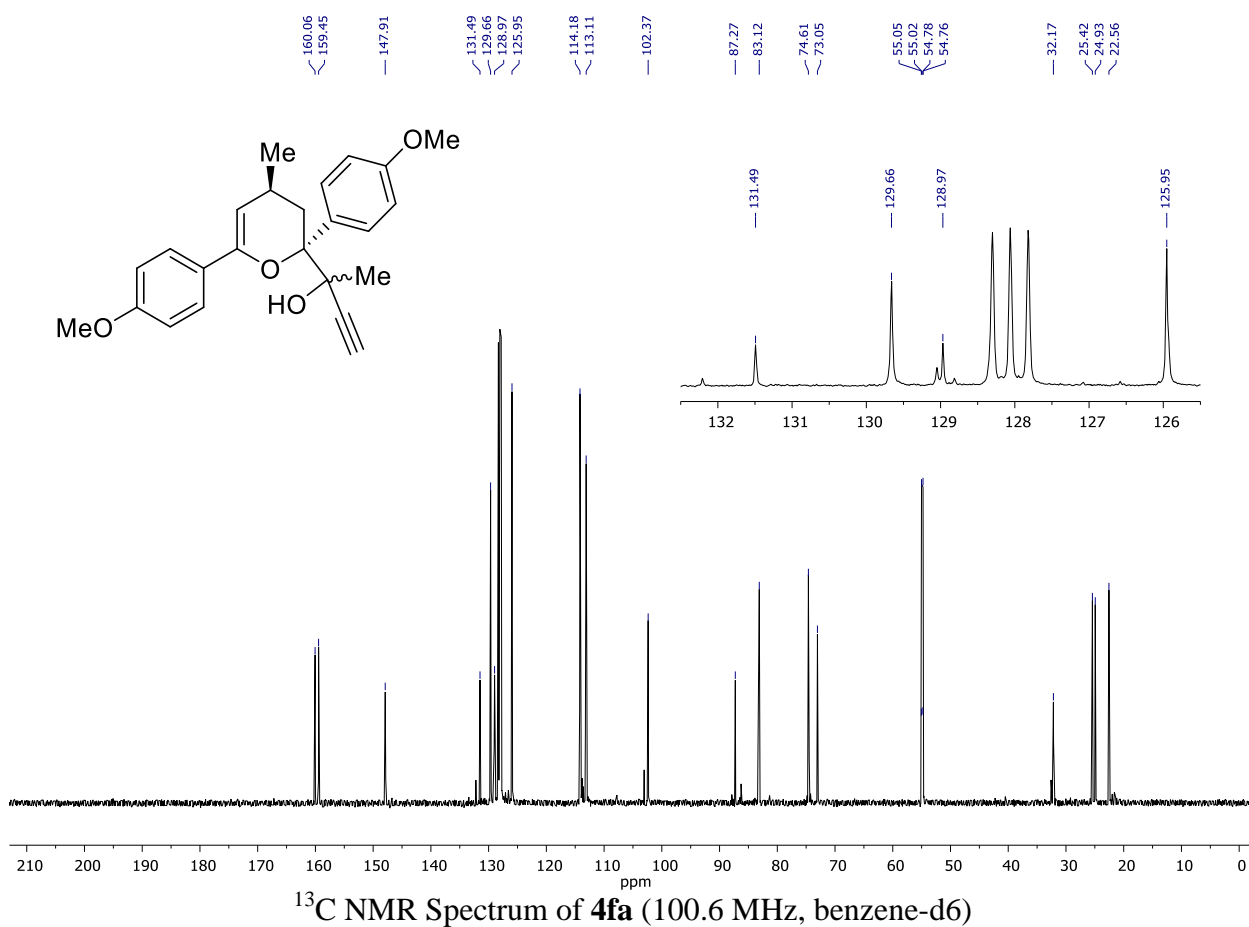
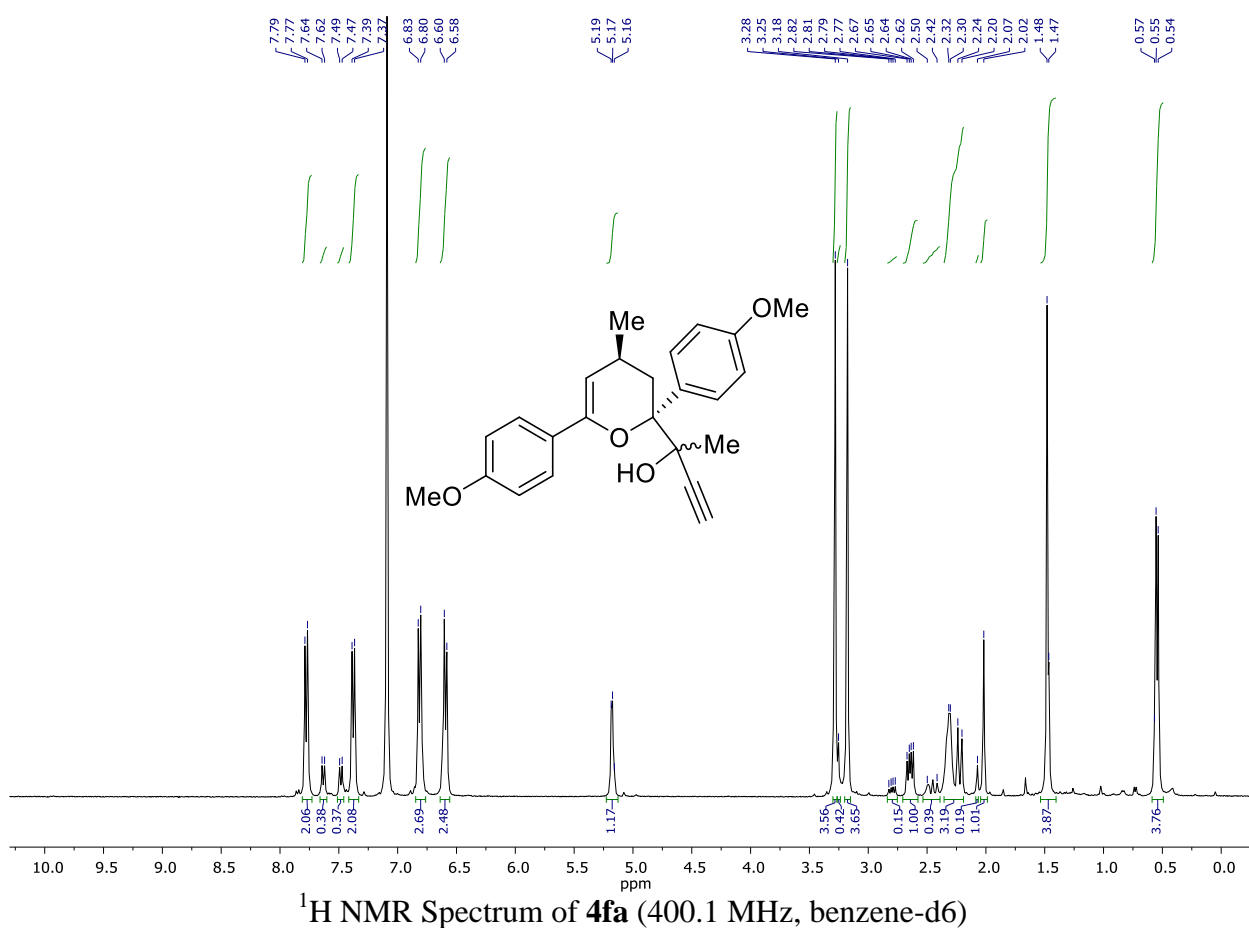


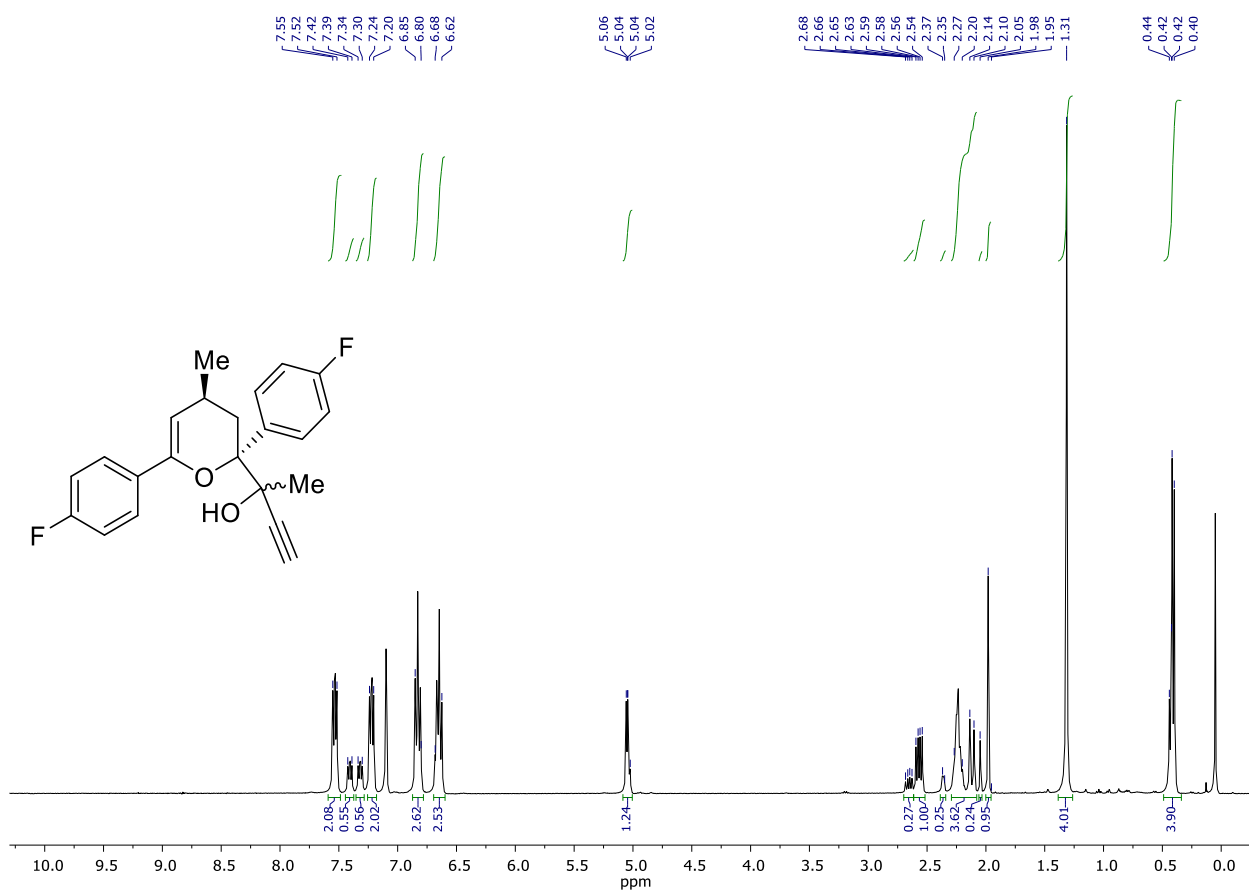
^{13}C NMR Spectrum of **4aa** (100.6 MHz, benzene- d_6)



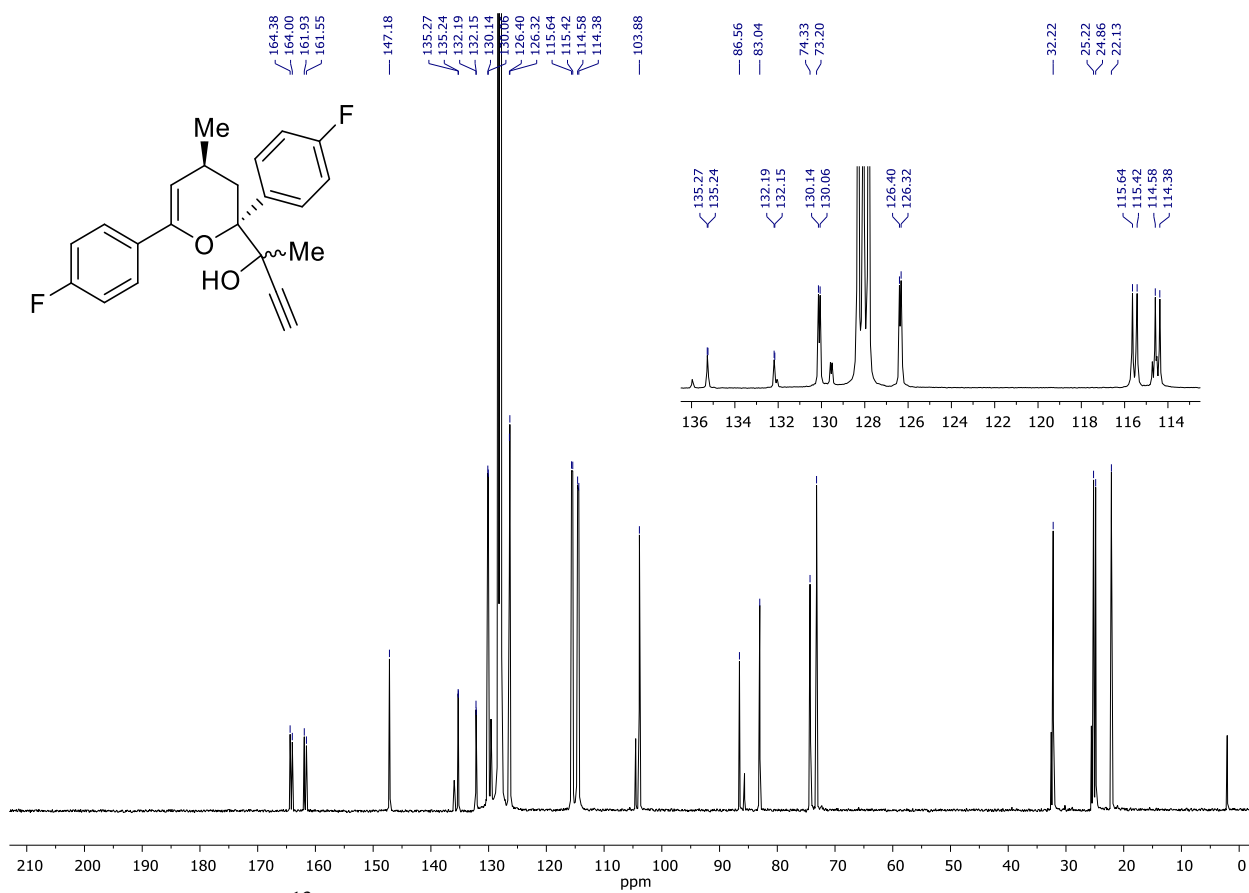




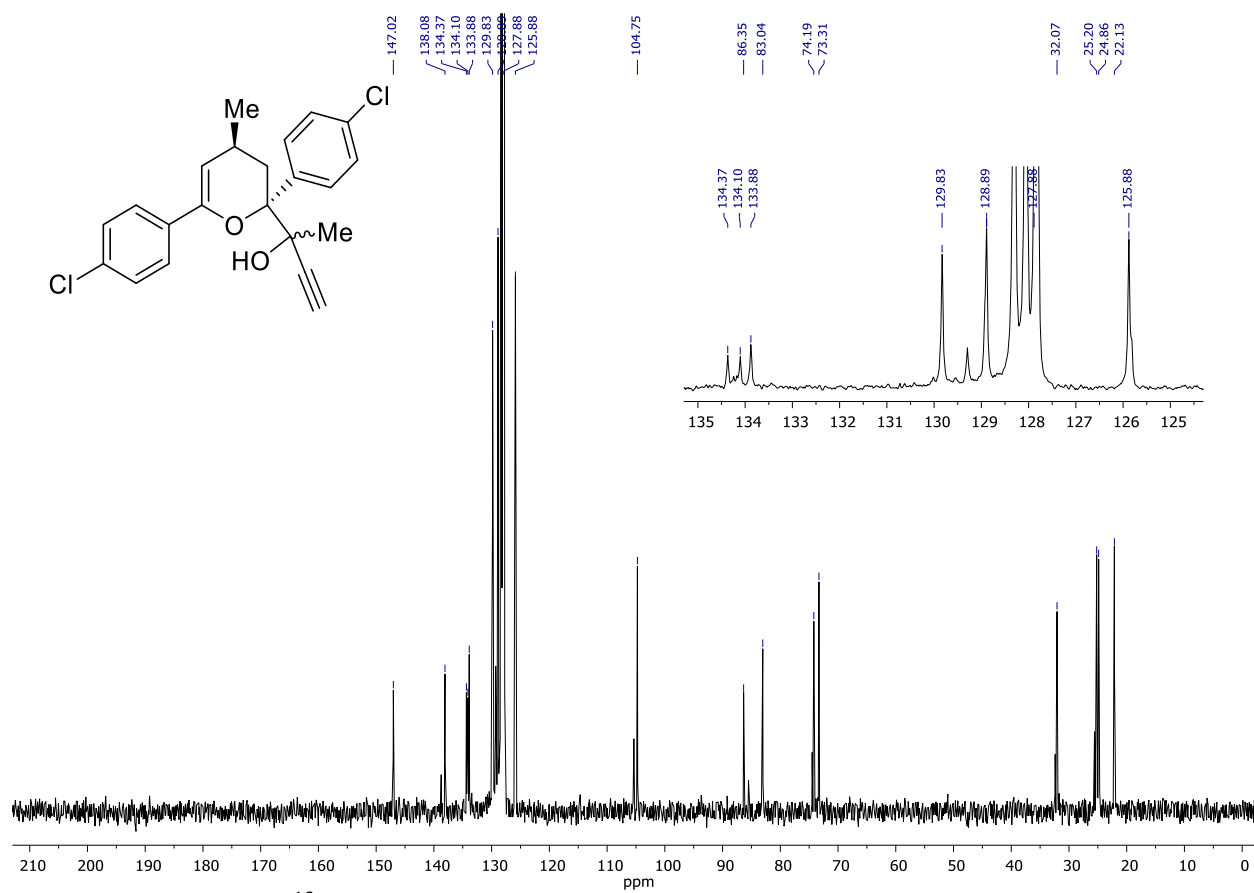
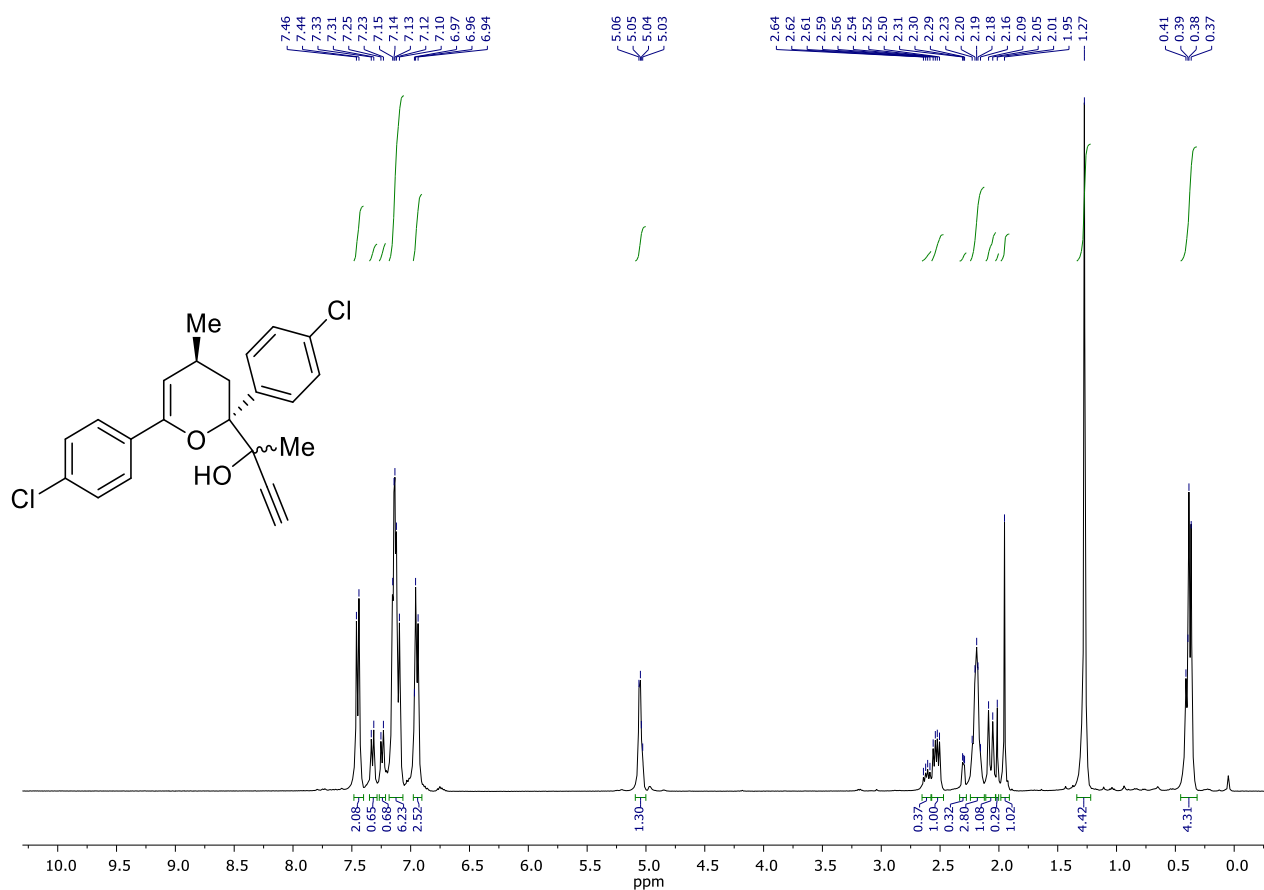


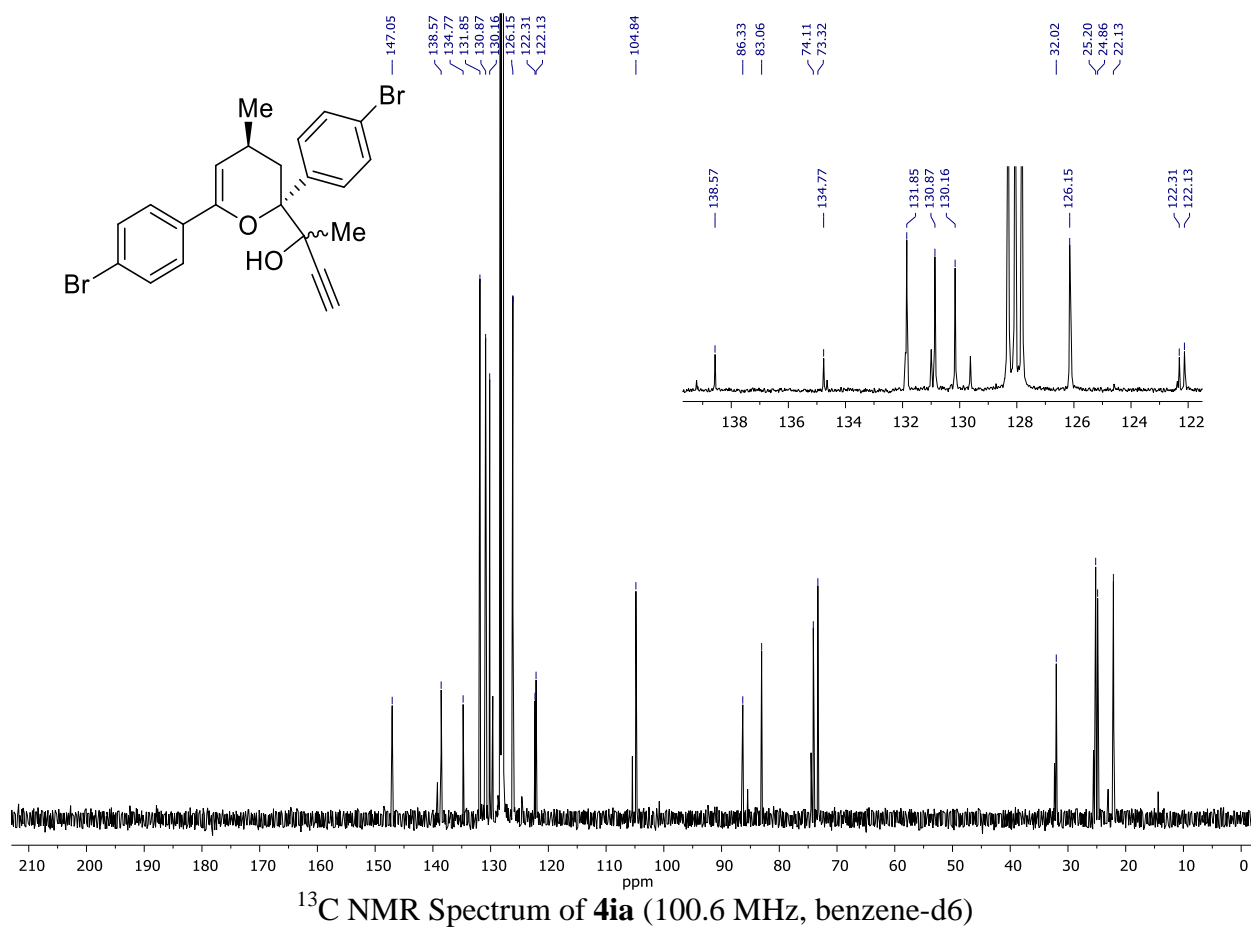
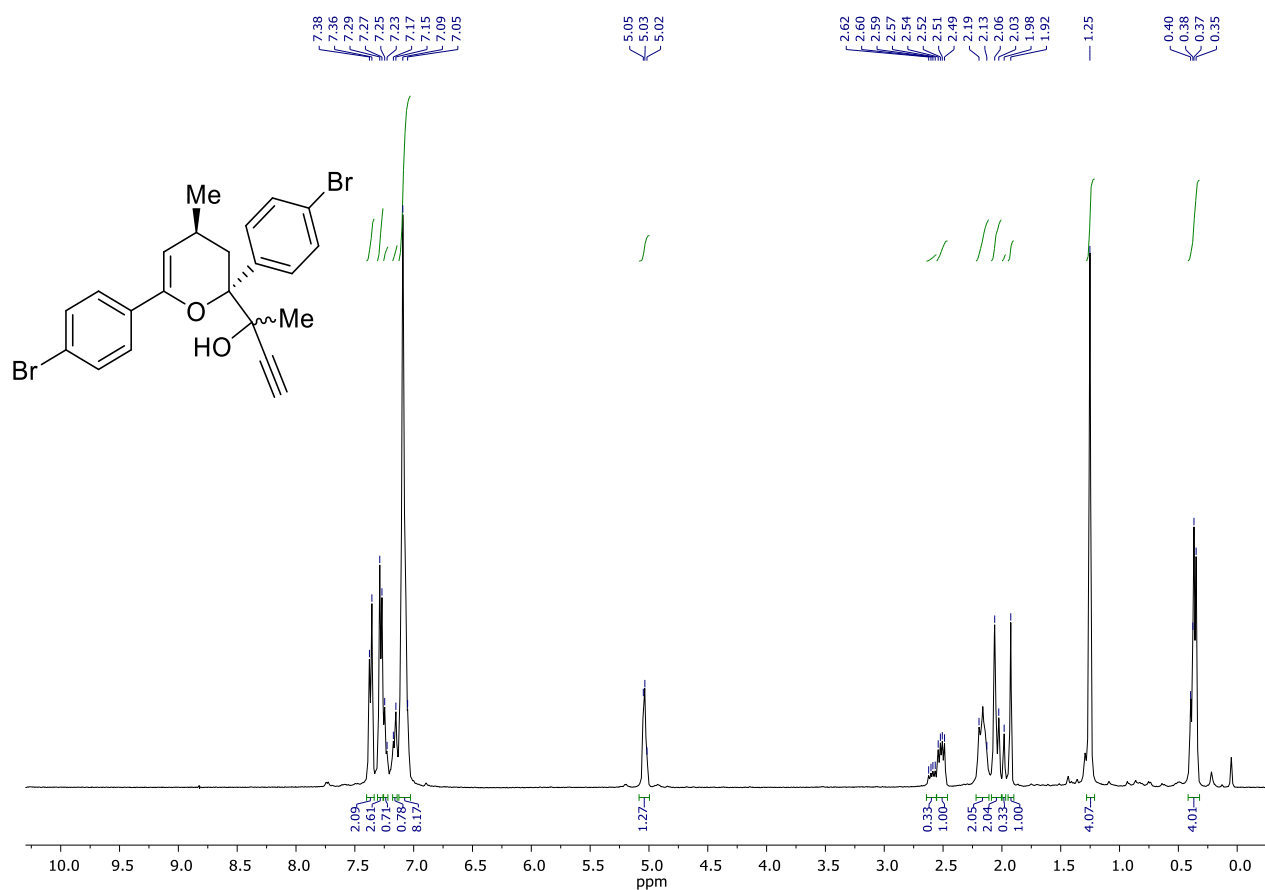


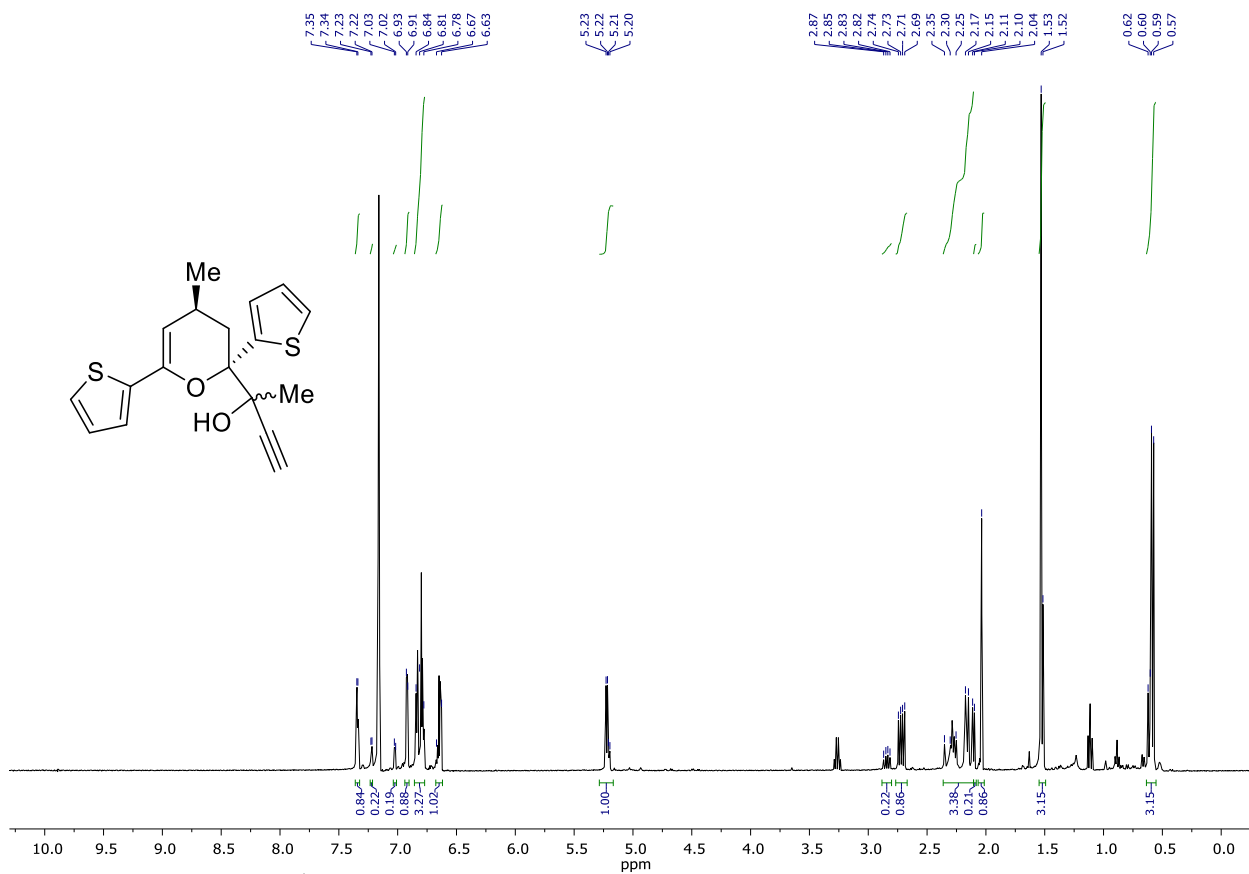
¹H NMR Spectrum of 4ga (400.1 MHz, benzene-d₆)



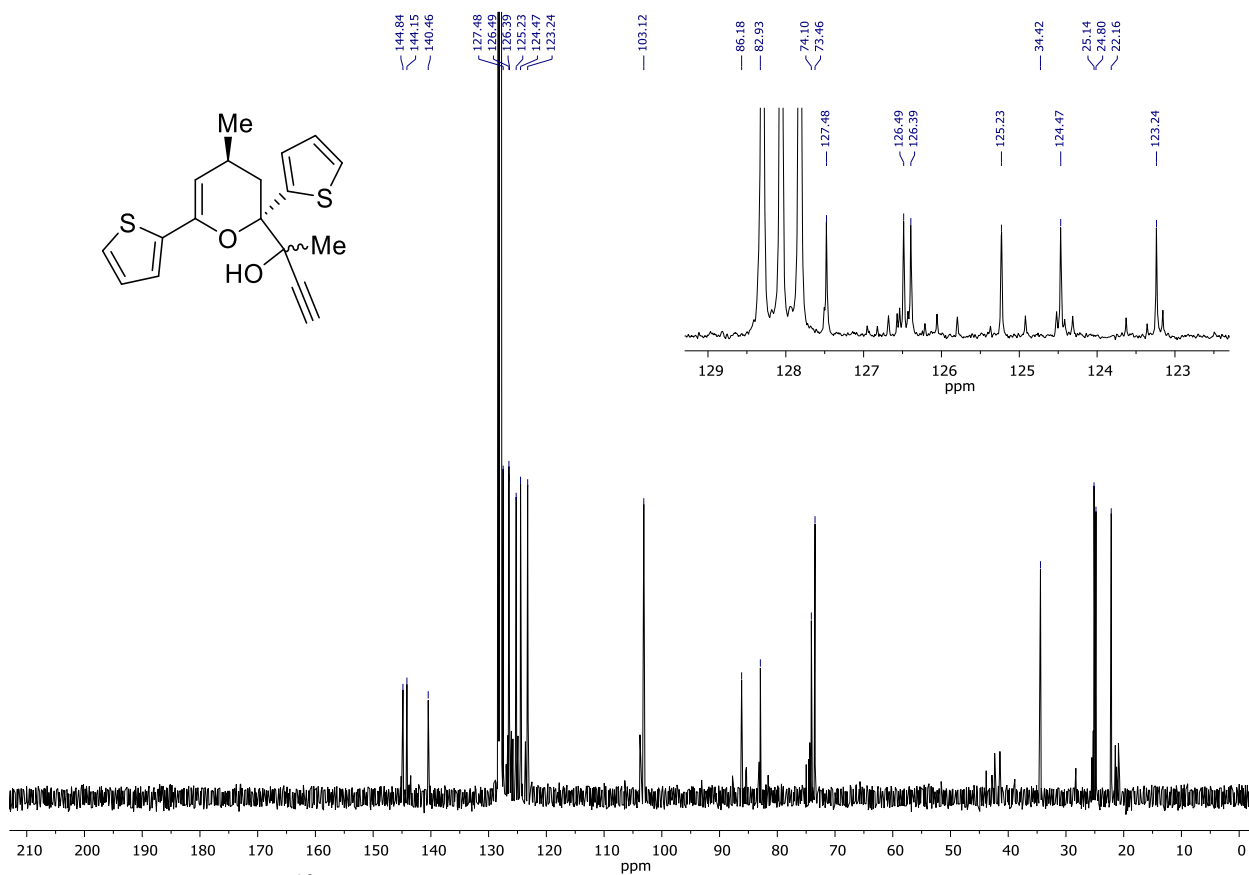
¹³C NMR Spectrum of 4ga (100.6 MHz, benzene-d₆)



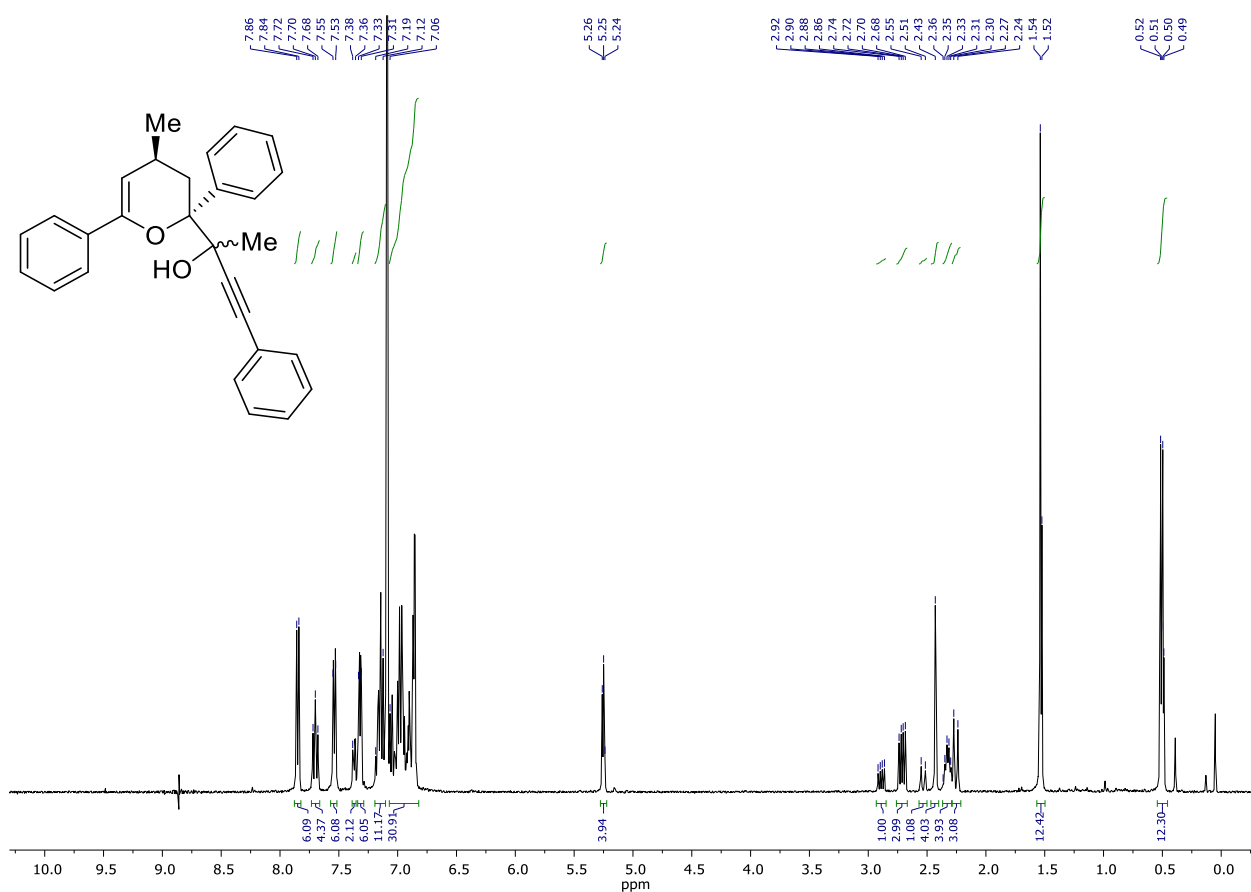




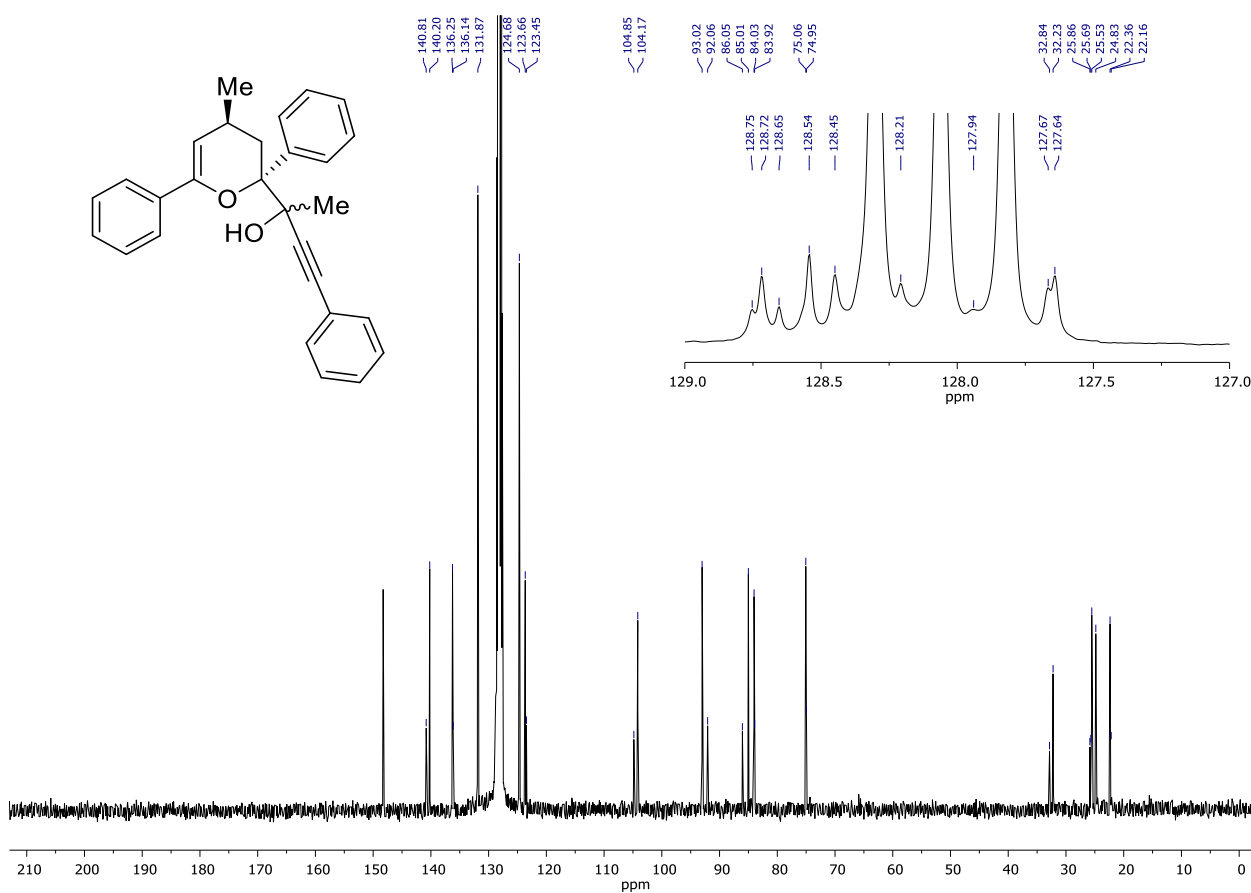
¹H NMR Spectrum of **4ja** (400.1 MHz, benzene-d₆)



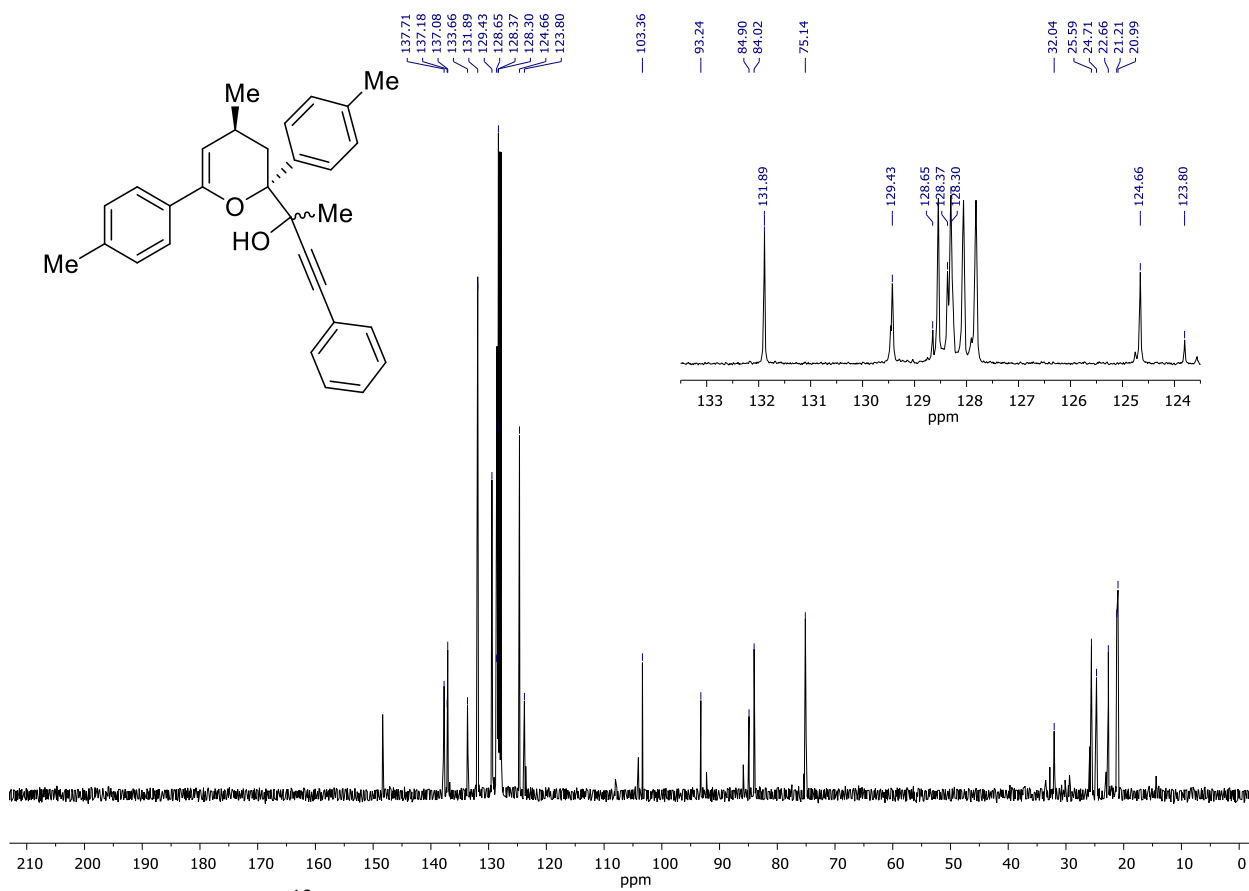
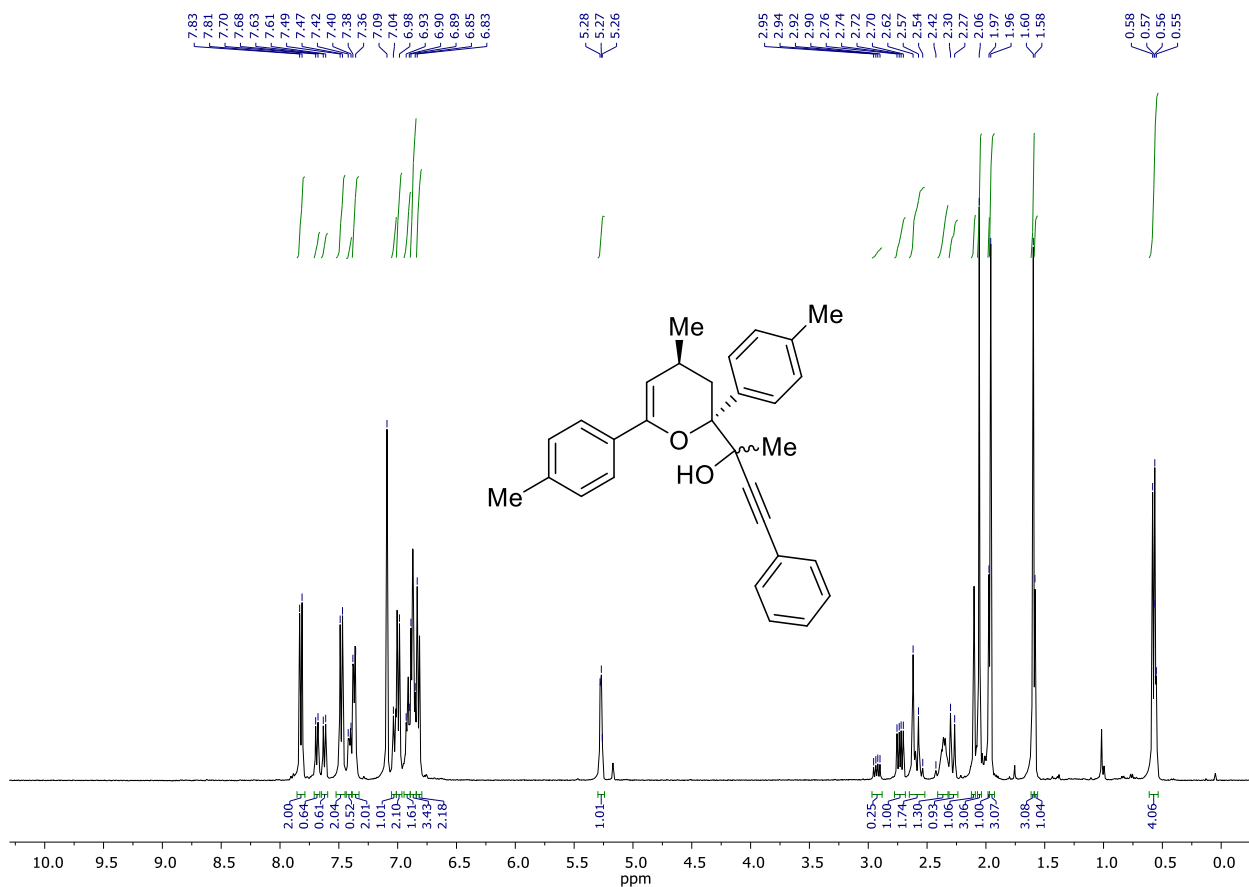
¹³C NMR Spectrum of **4ja** (100.6 MHz, benzene-d₆)

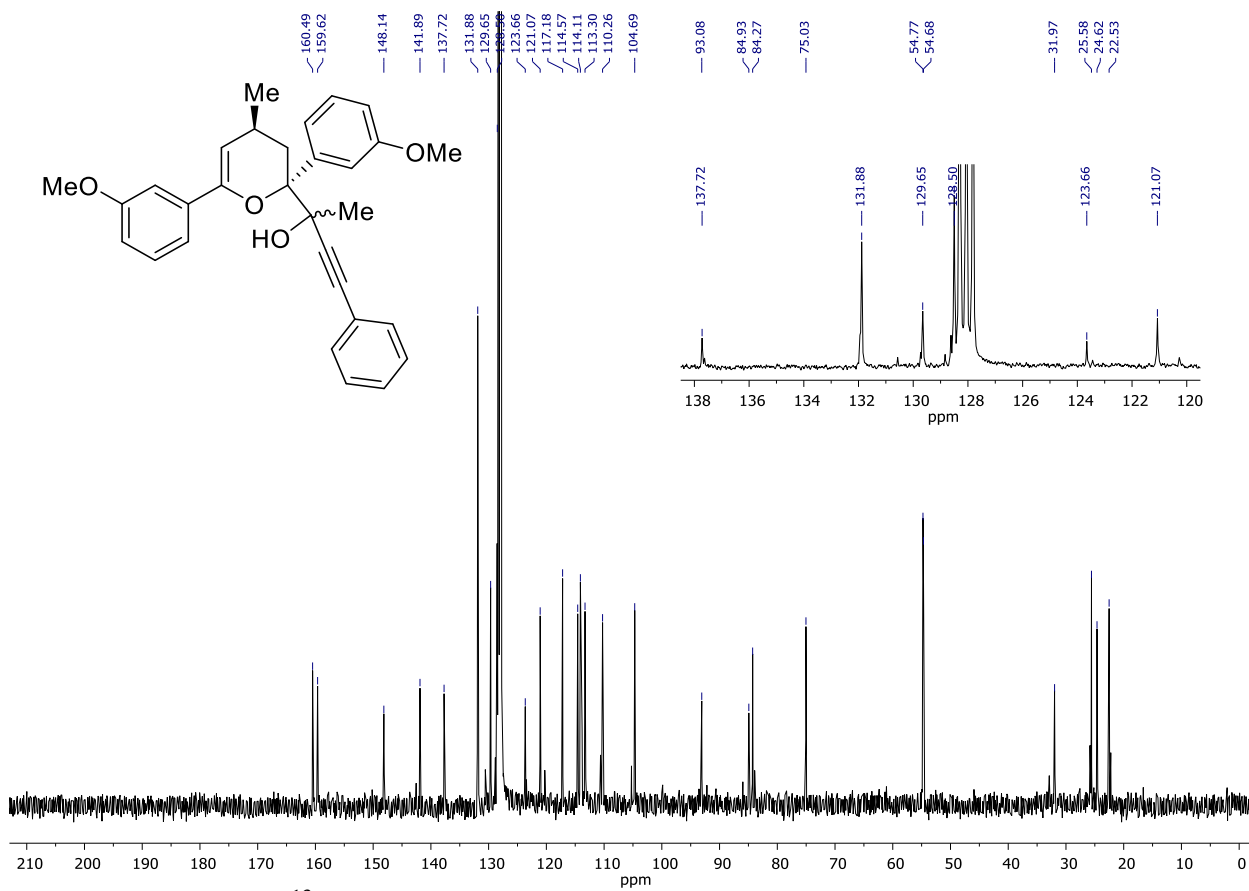
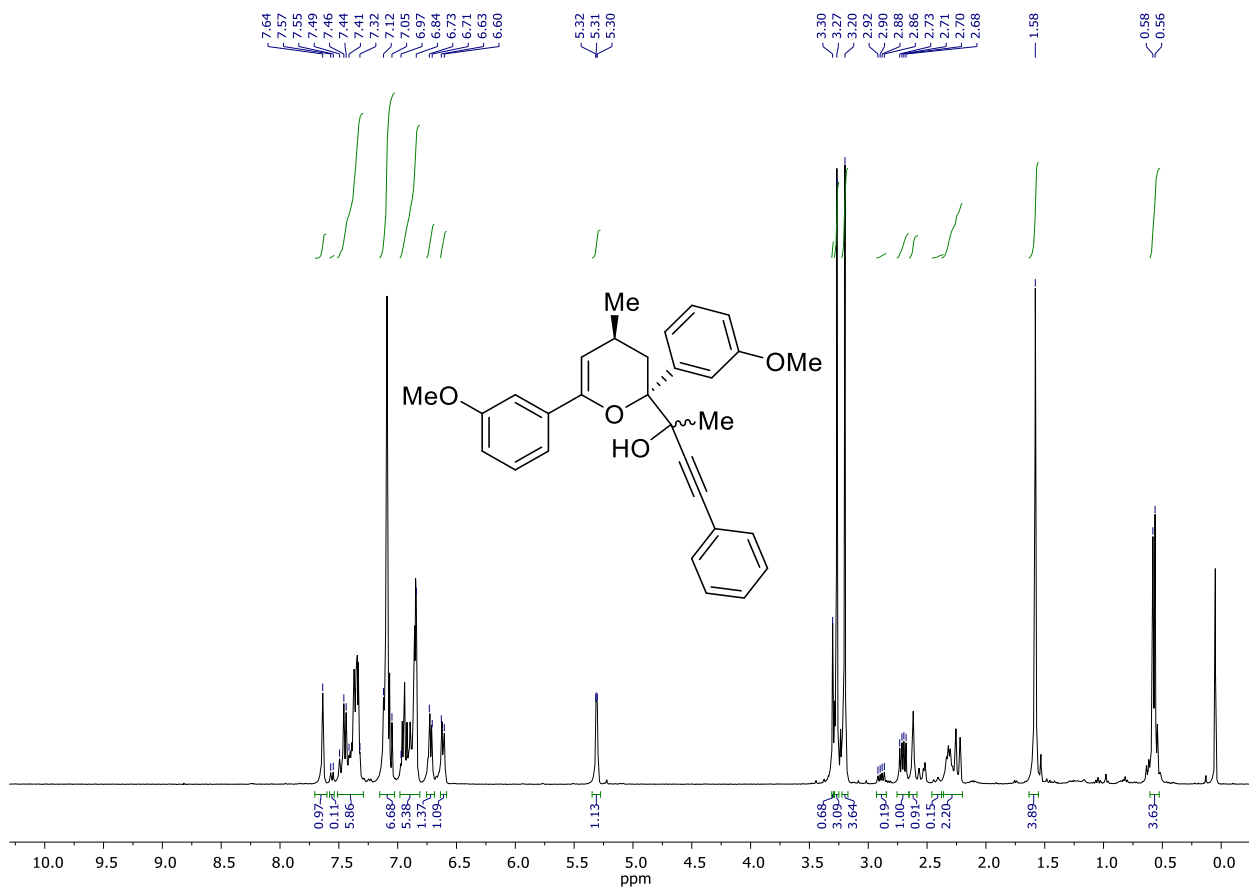


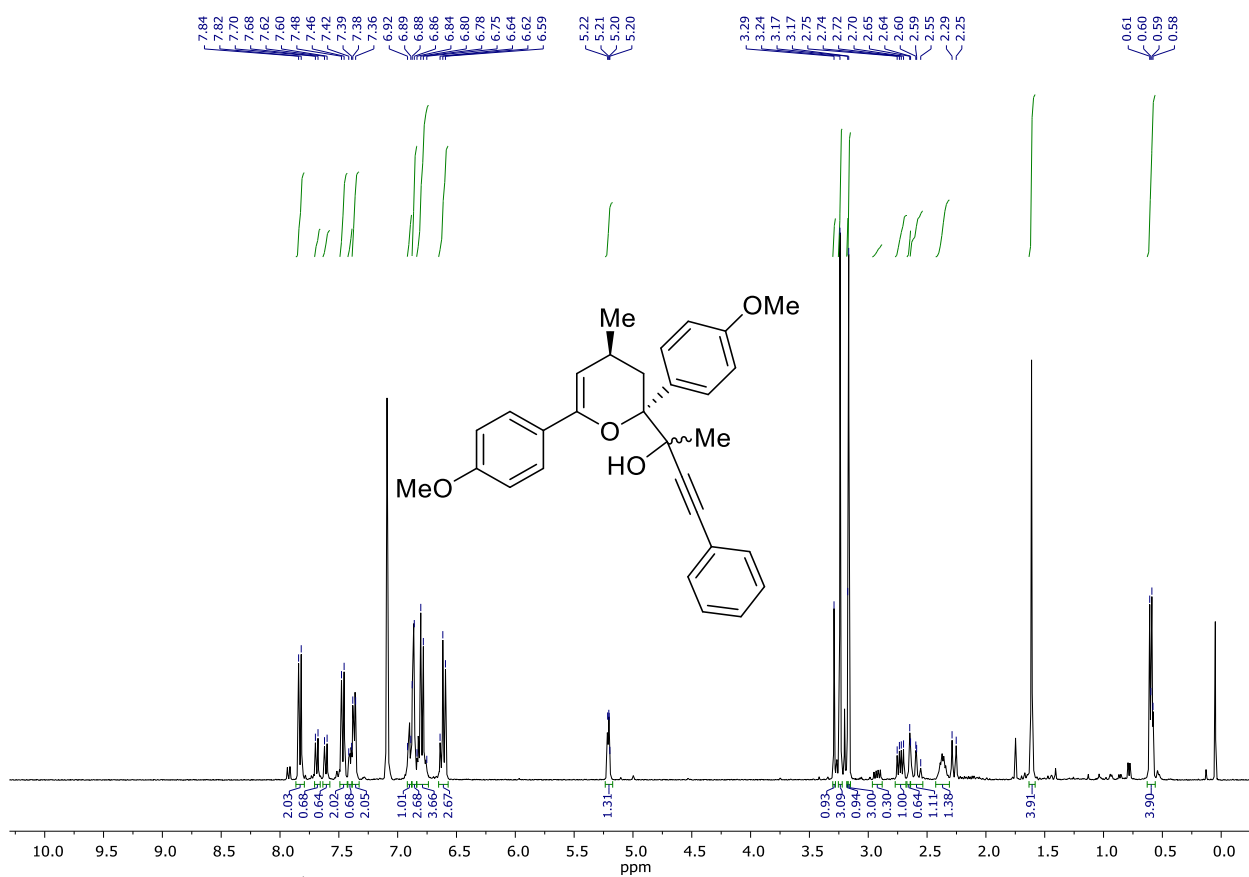
¹H NMR Spectrum of **4ab** (400.1 MHz, benzene-d₆)



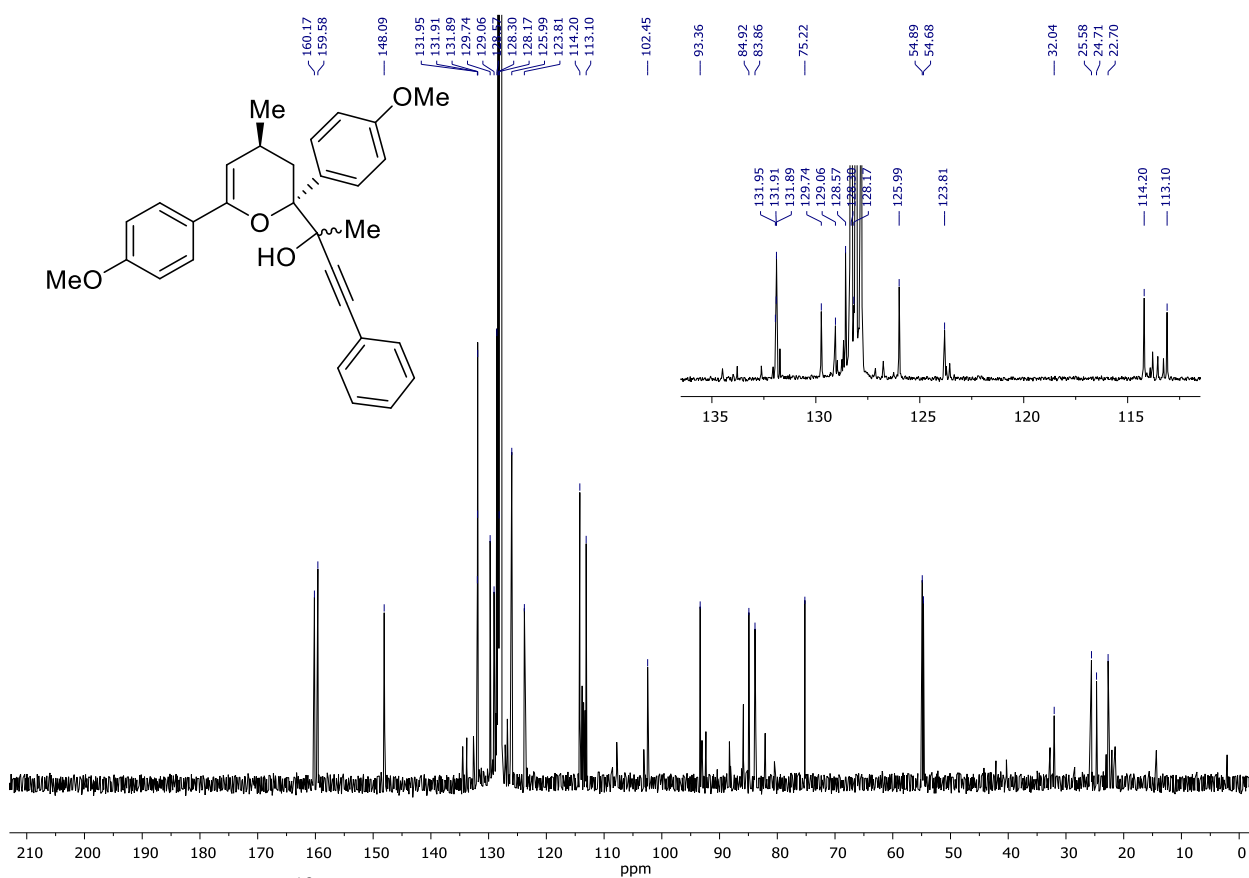
¹³C NMR Spectrum of **4ab** (100.6 MHz, benzene-d₆)



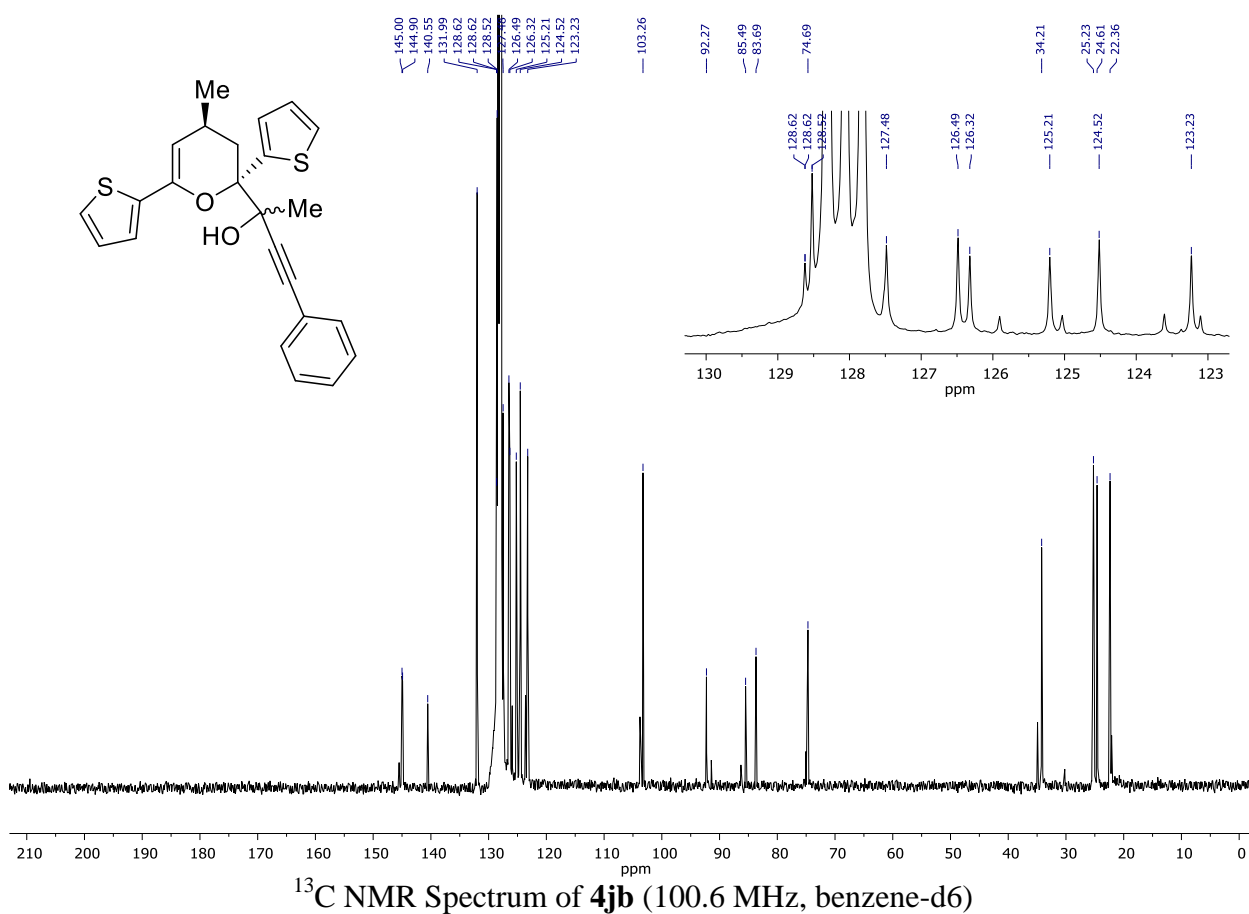
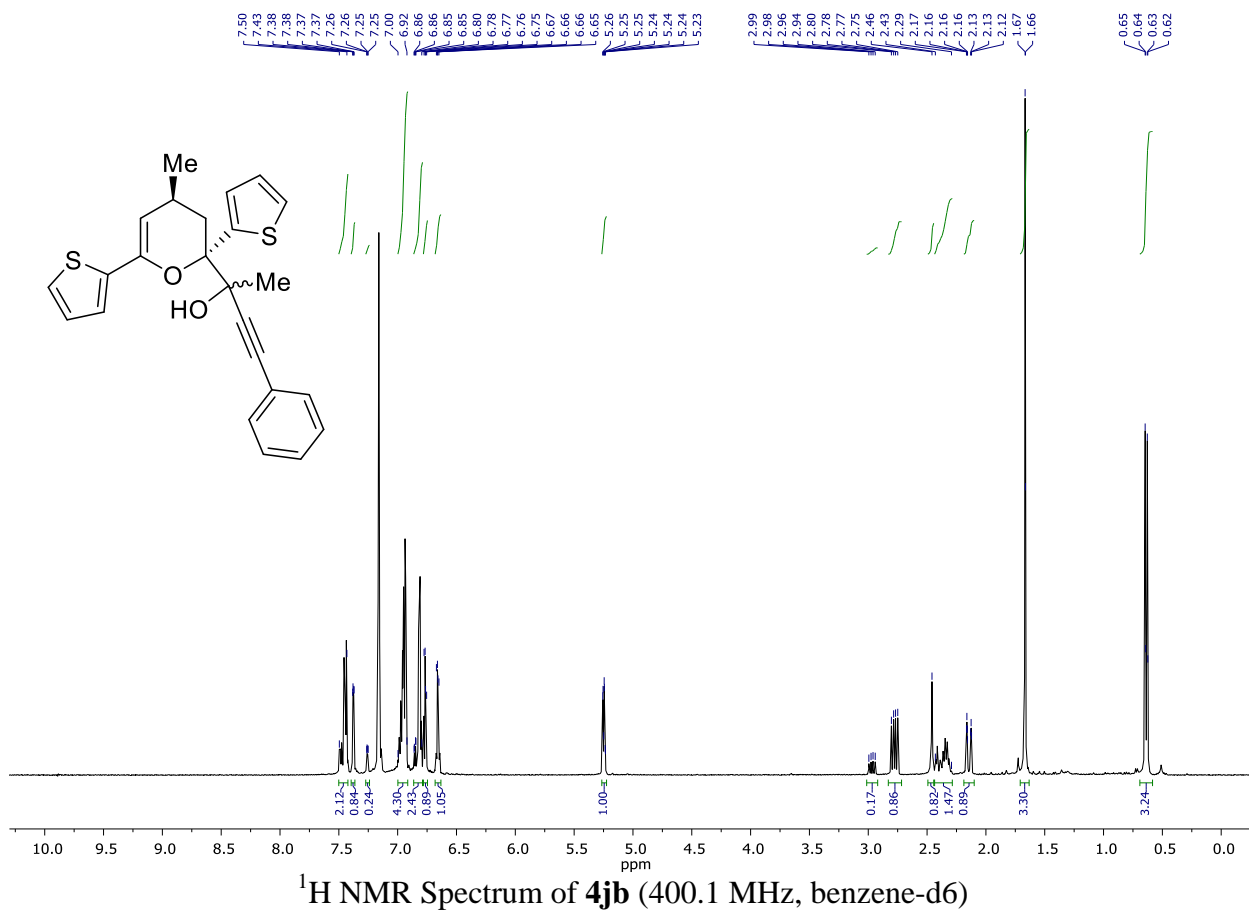


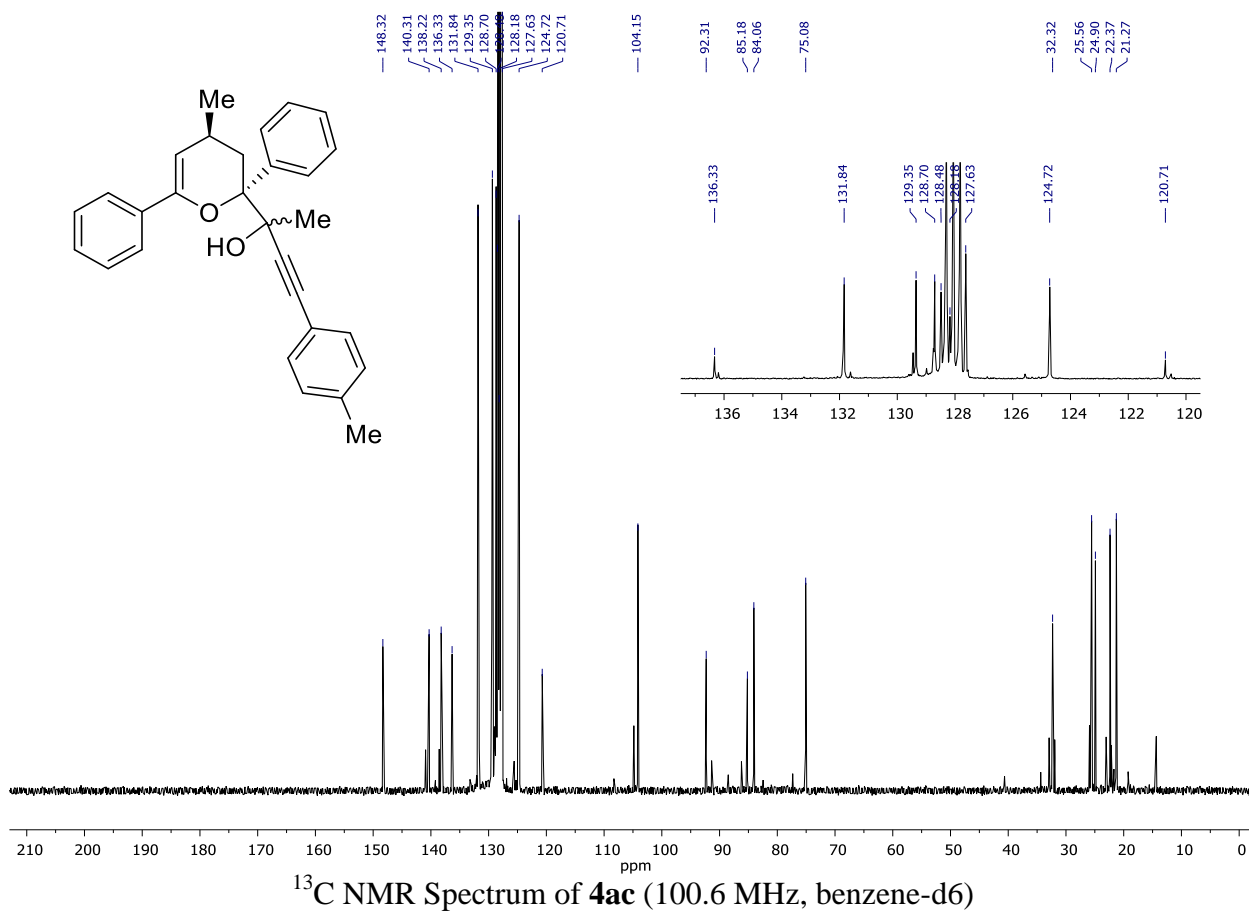
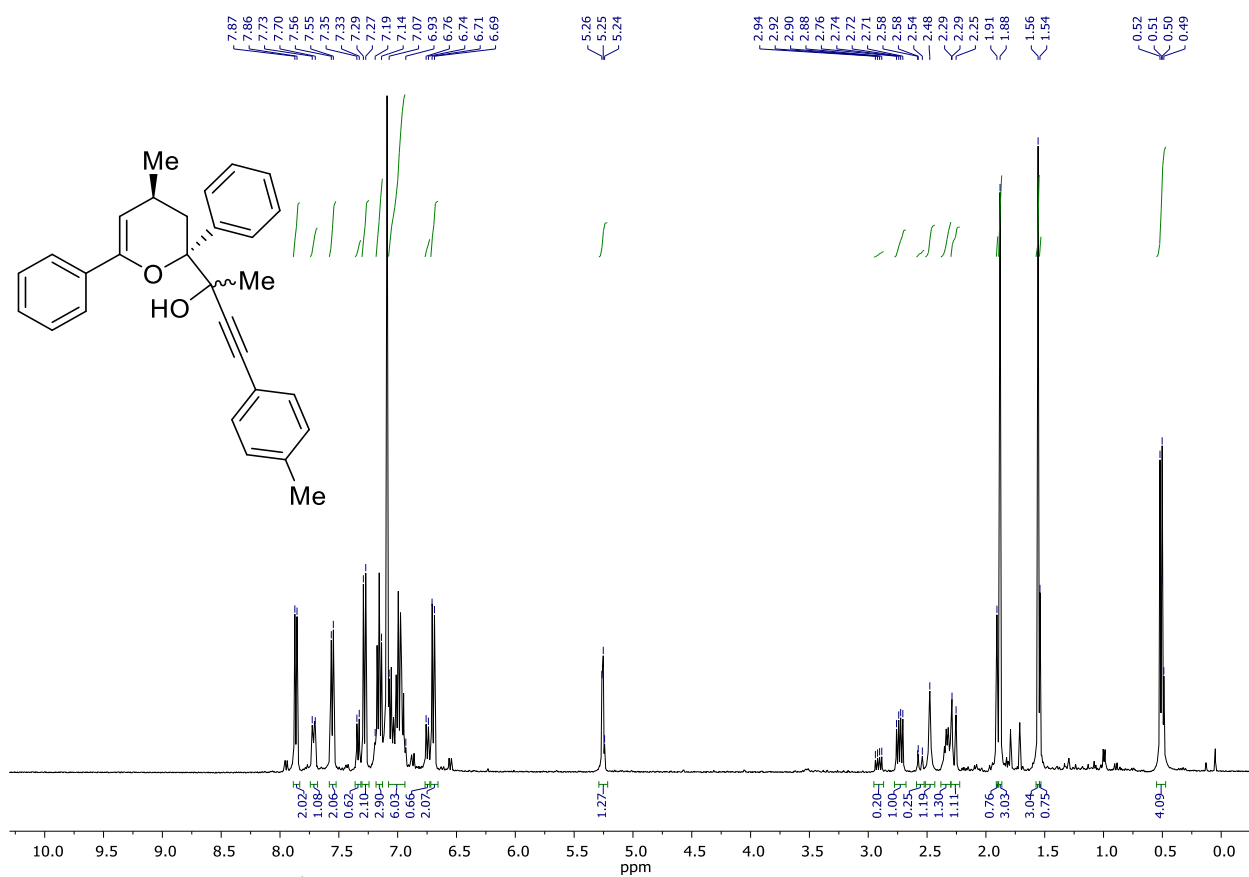


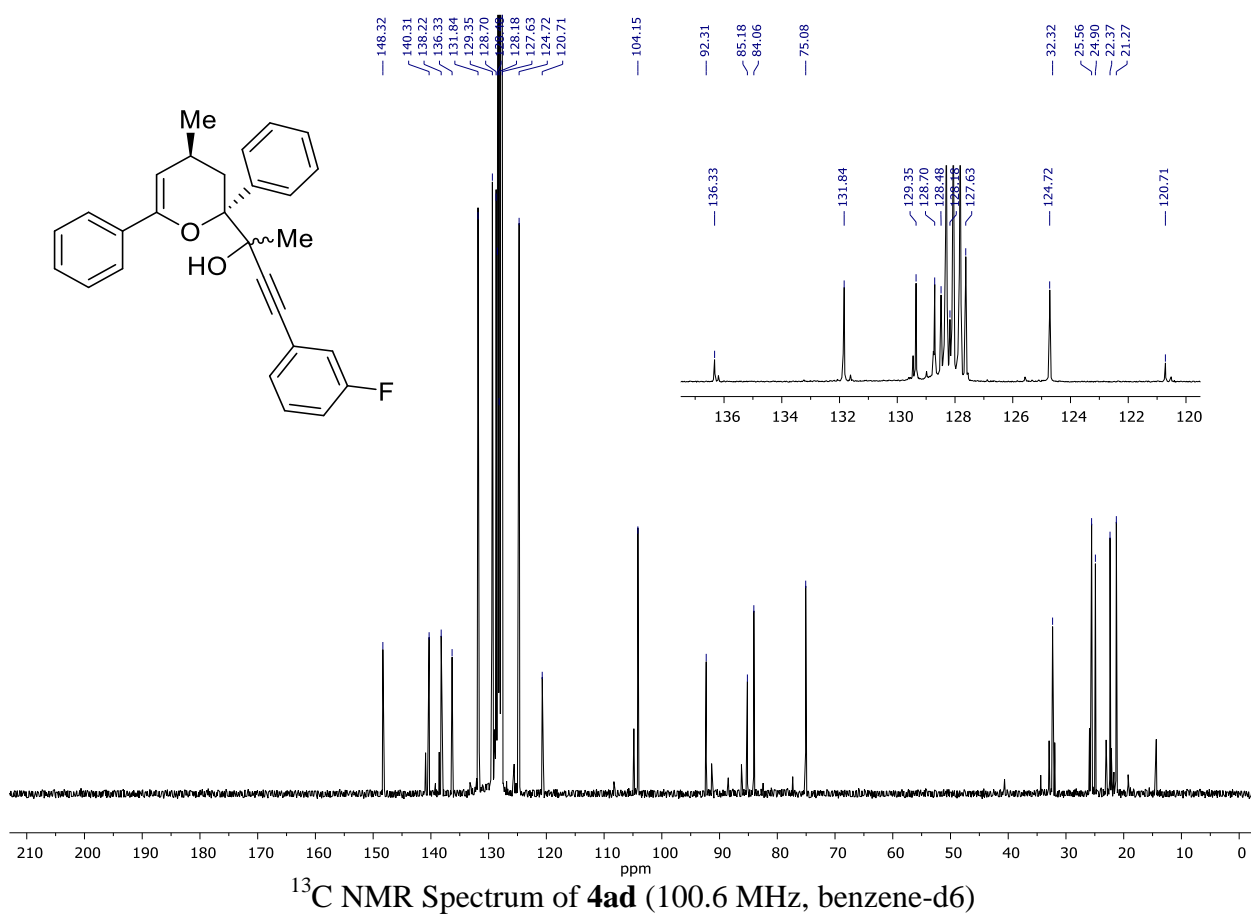
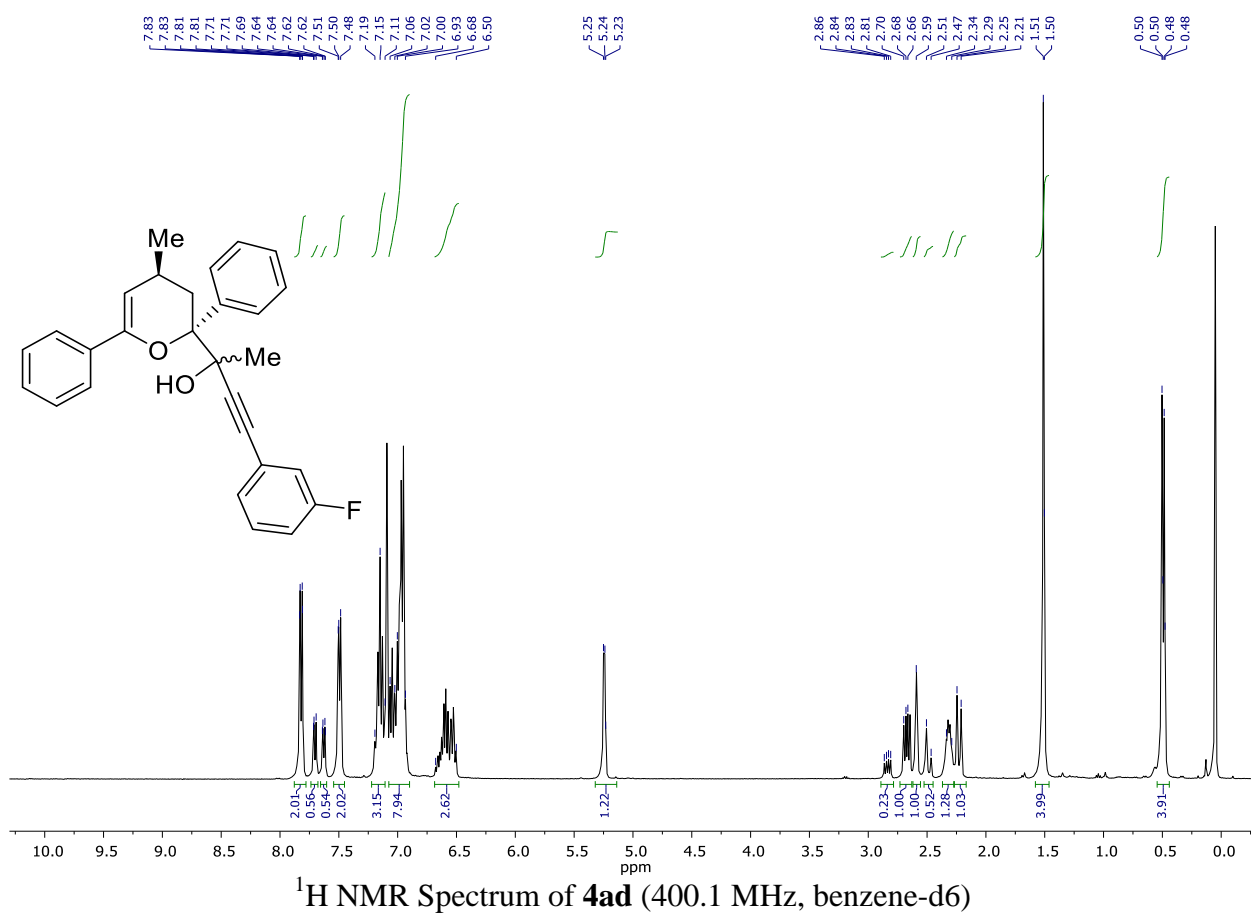
¹H NMR Spectrum of 4fb (400.1 MHz, benzene-d₆)

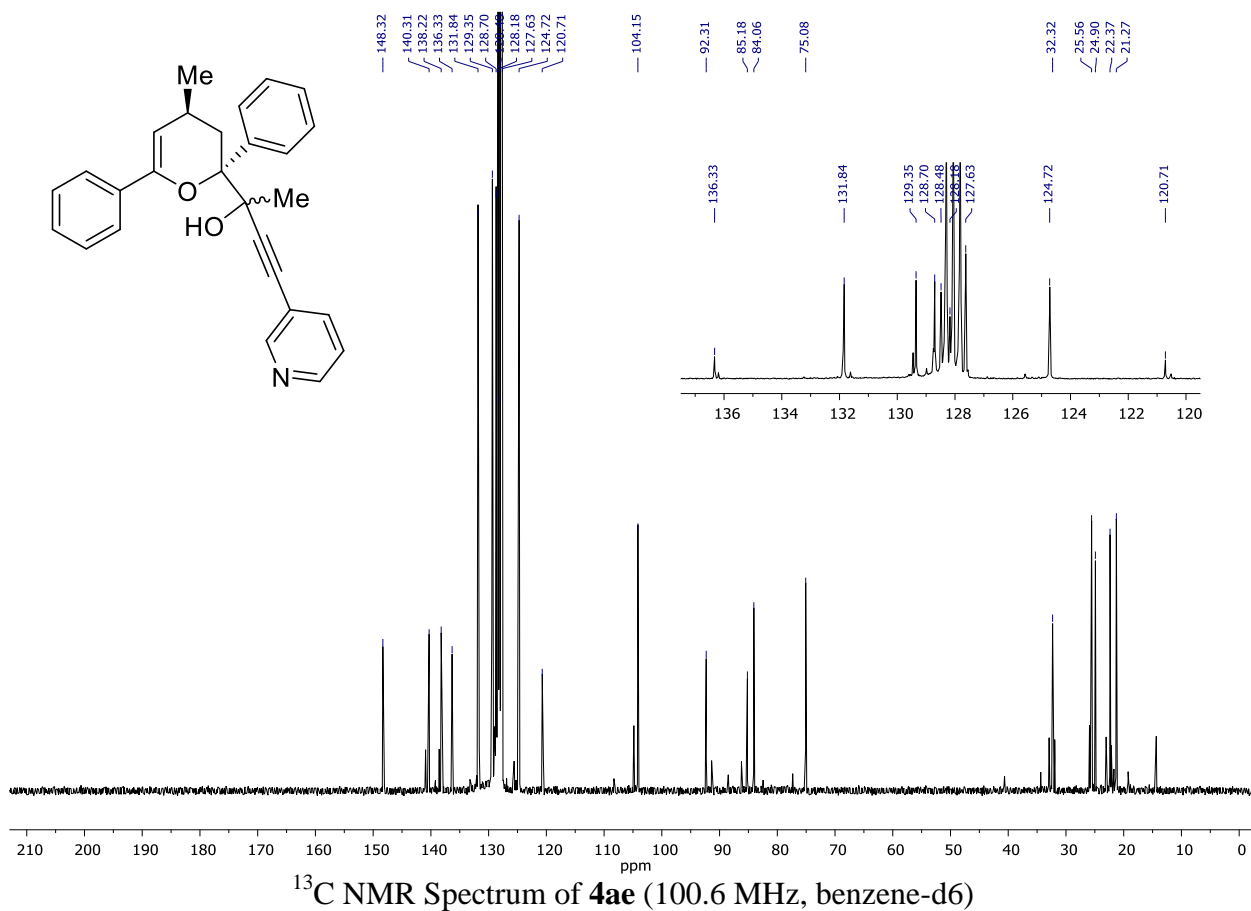
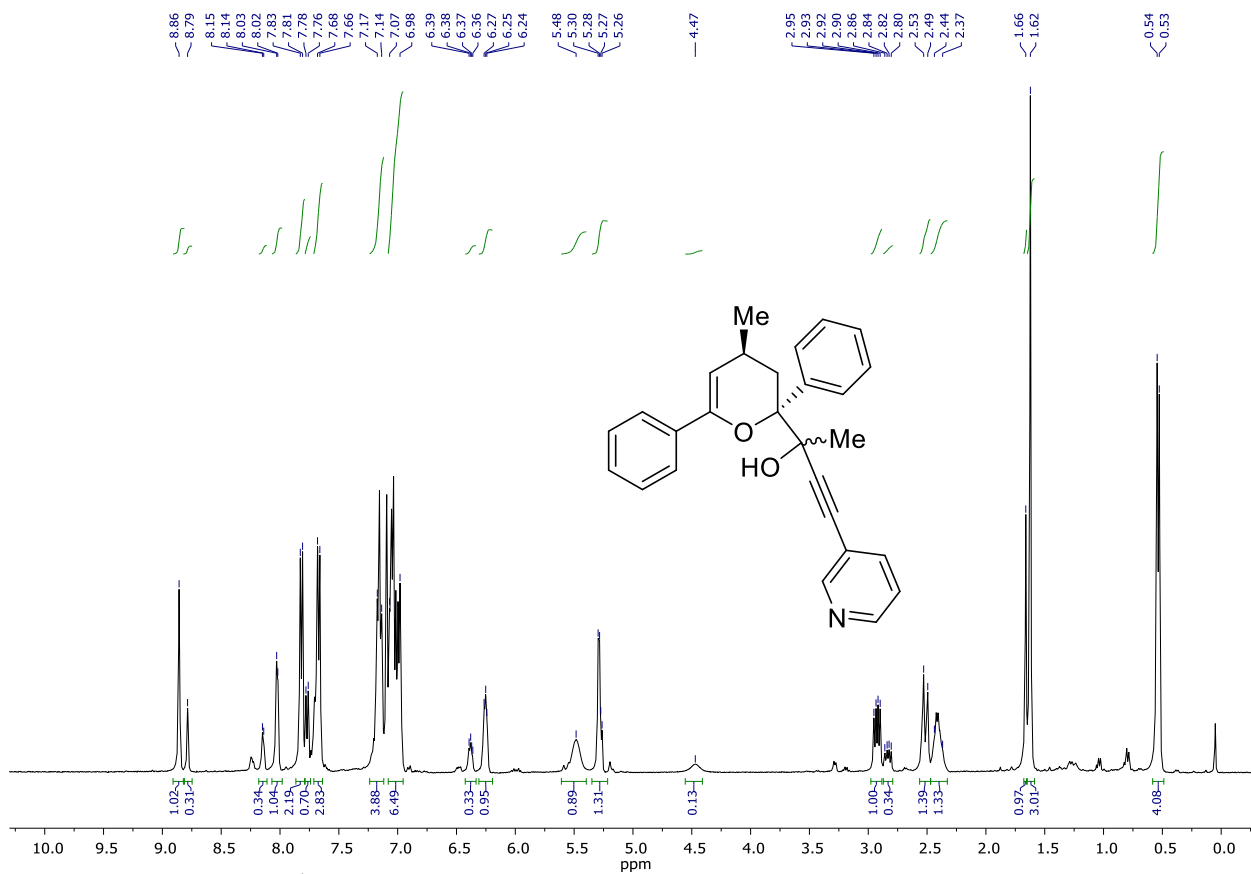


¹³C NMR Spectrum of 4fb (100.6 MHz, benzene-d₆)

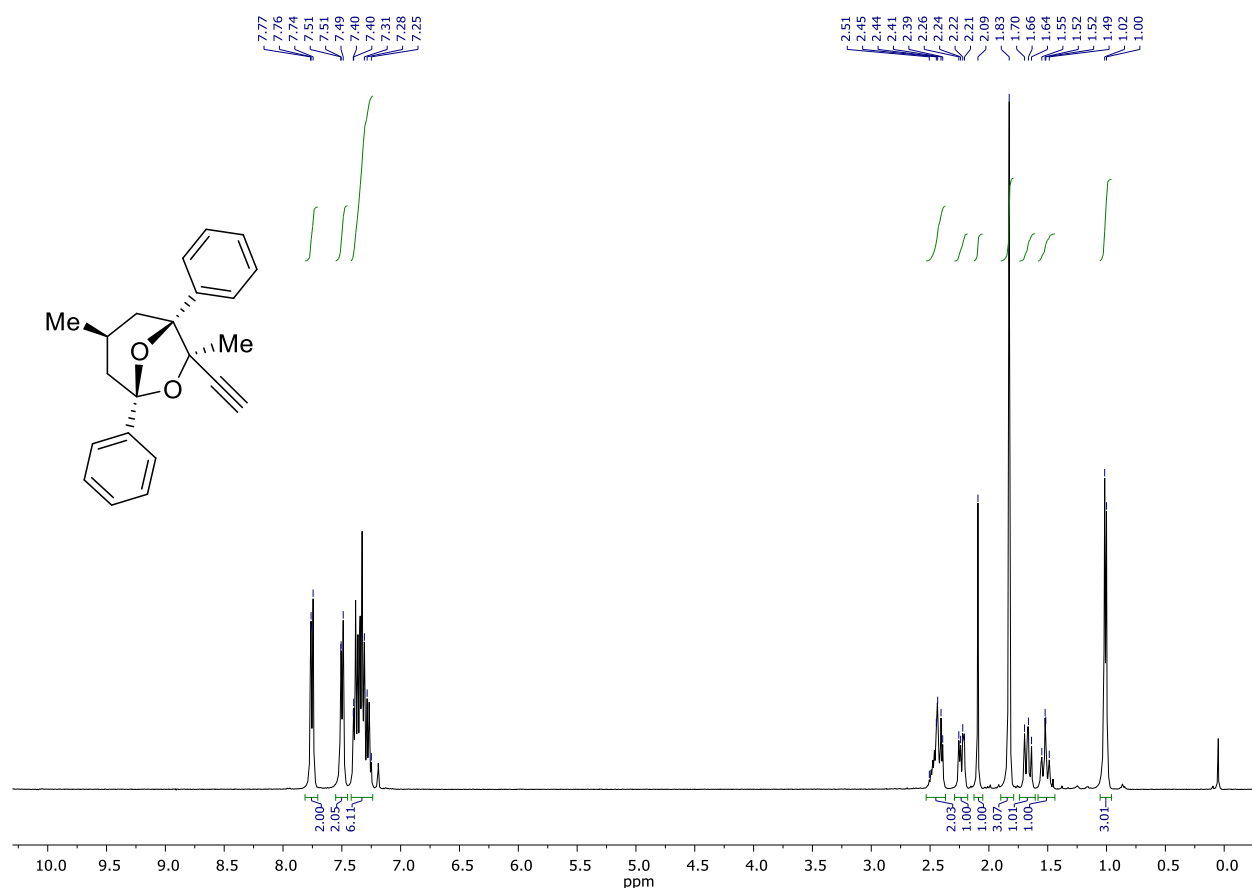




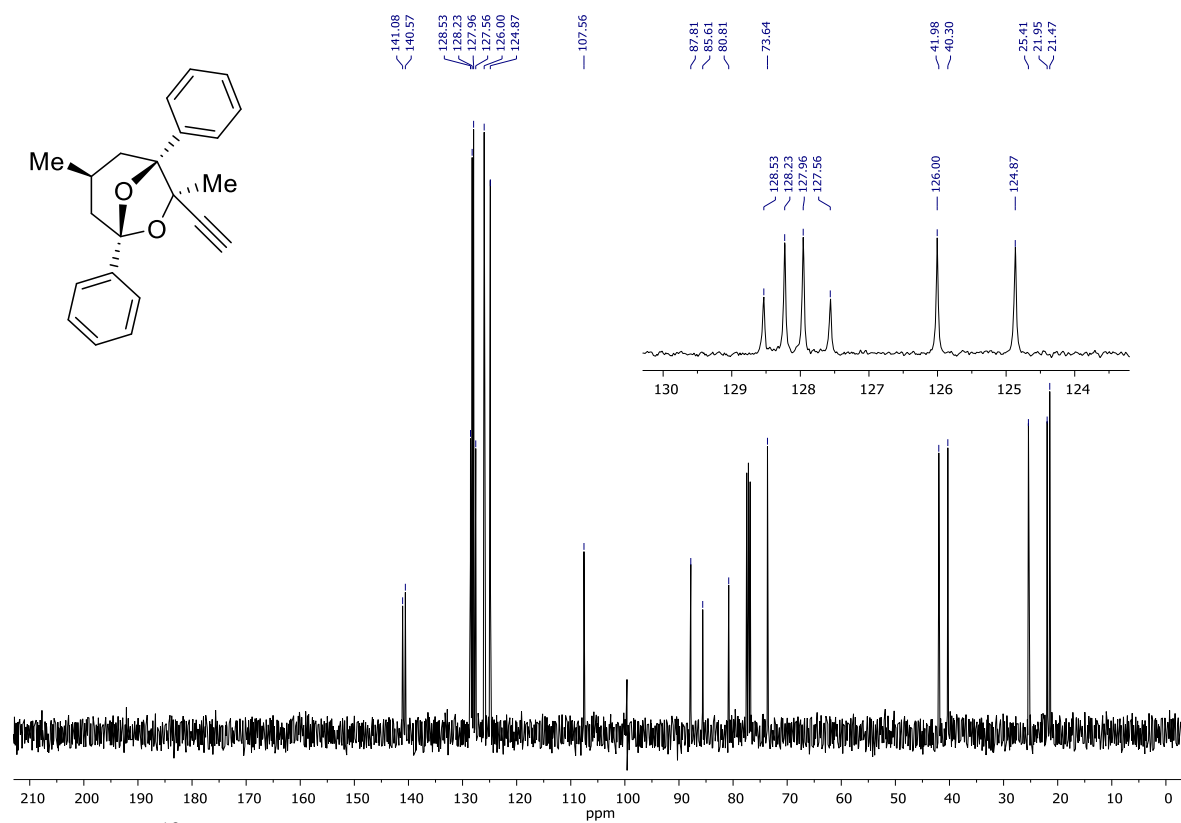




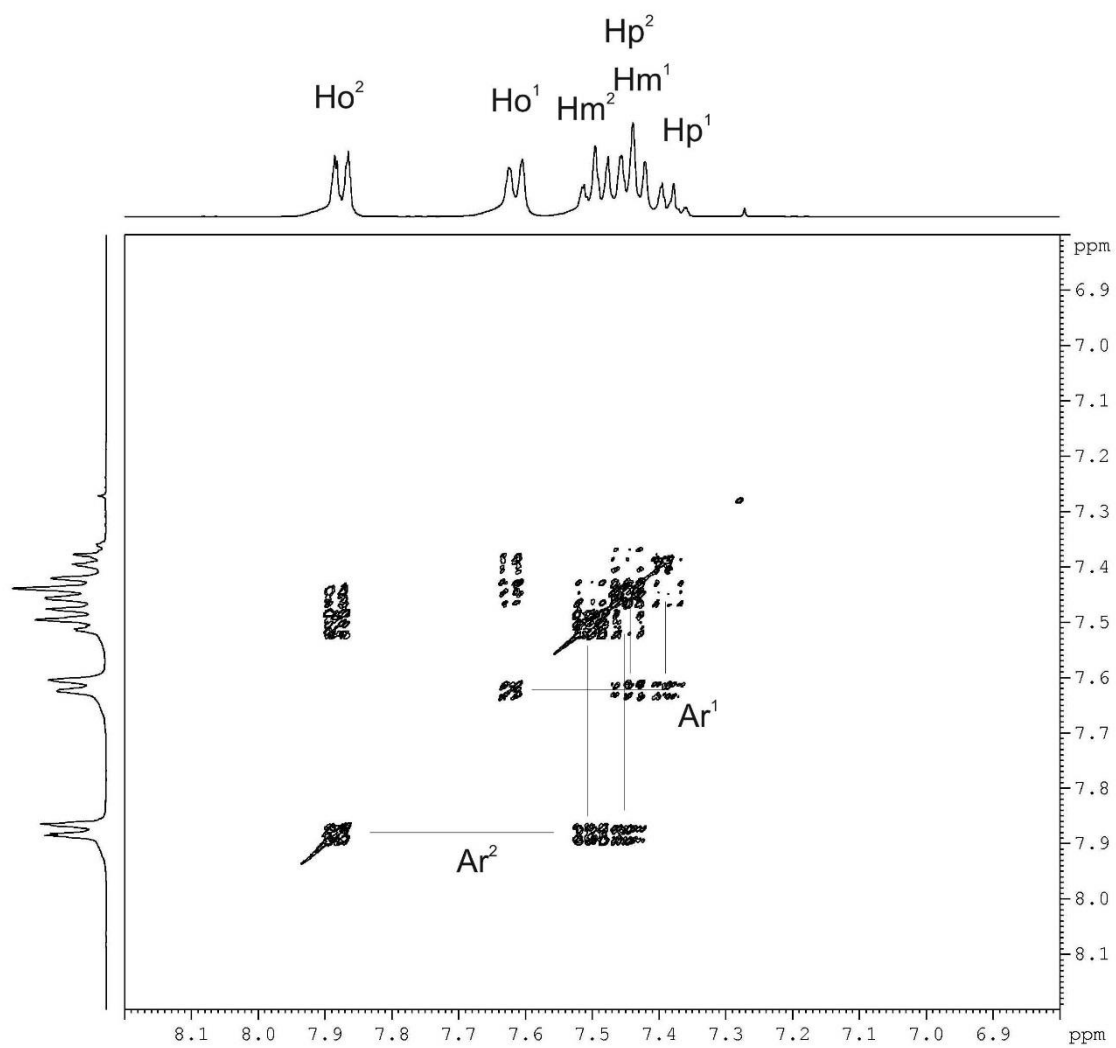
^1H and ^{13}C Spectra of 7-ethynyl-6,8-dioxabicyclo[3.2.1]octanes **5**



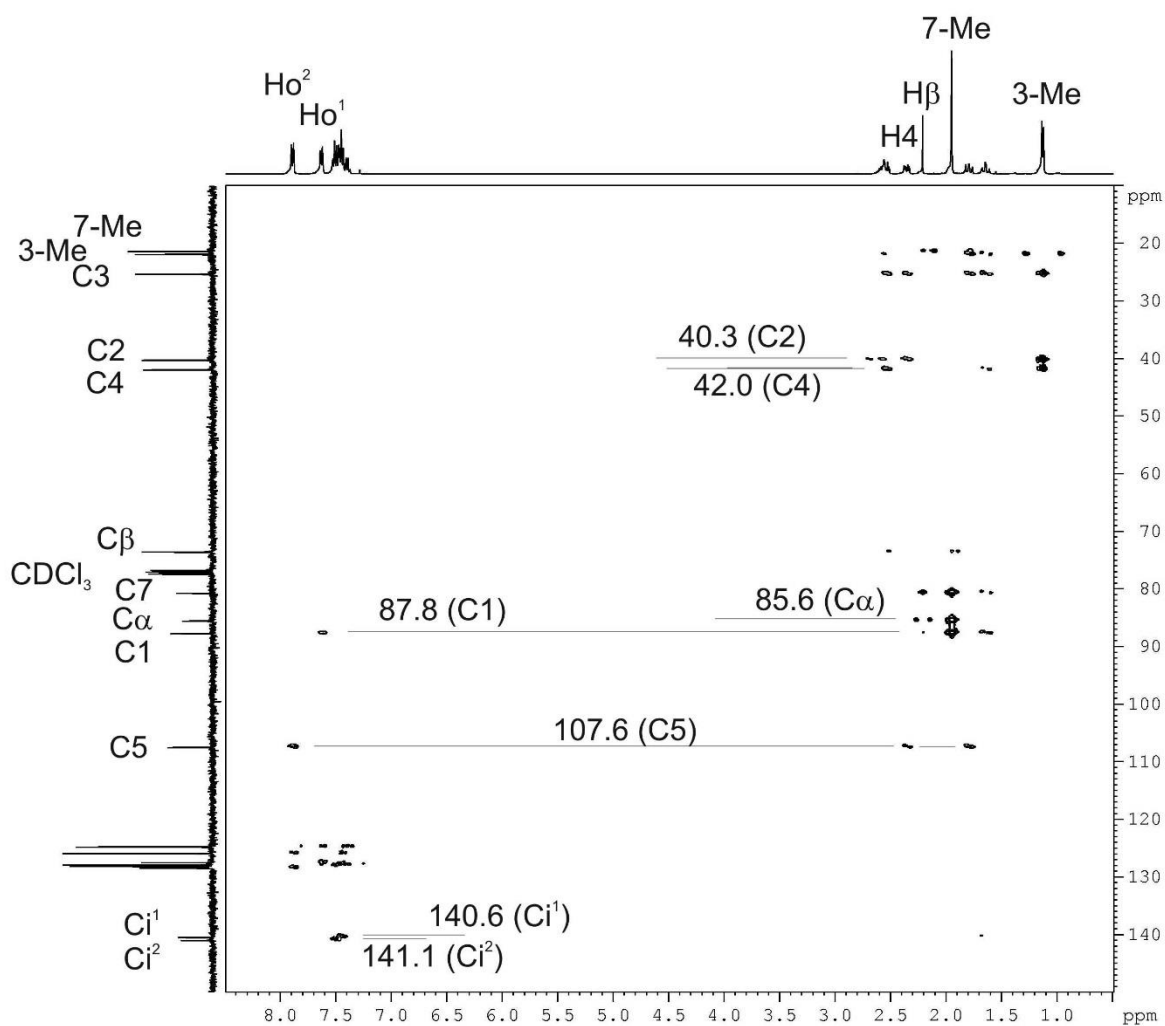
^1H NMR Spectrum of $(1S^*,3S^*,5R^*,7R^*)$ -**5aa** (400.1 MHz, CDCl₃)



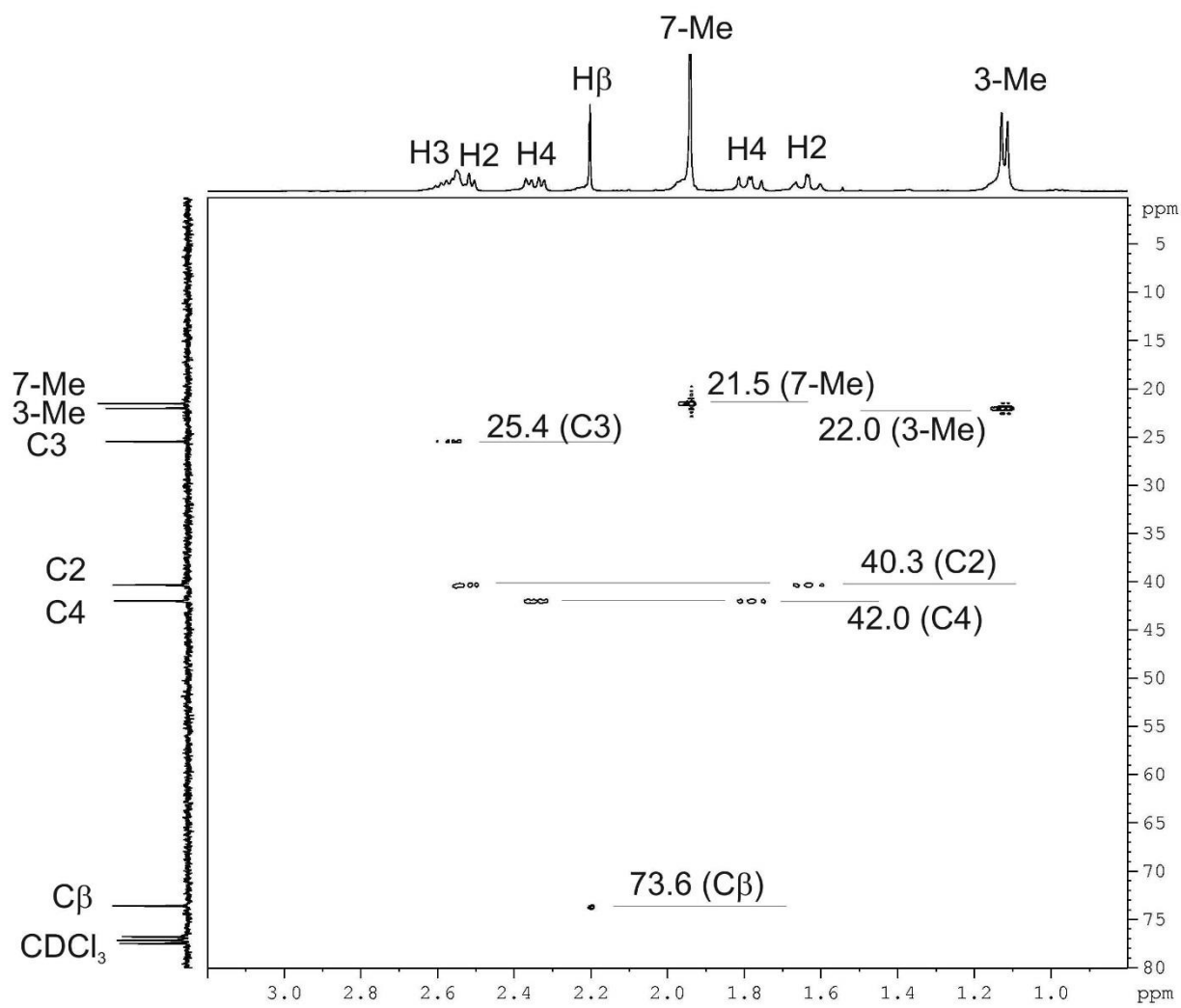
^{13}C NMR Spectrum of $(1S^*,3S^*,5R^*,7R^*)$ -**5aa** (100.6 MHz, CDCl₃)

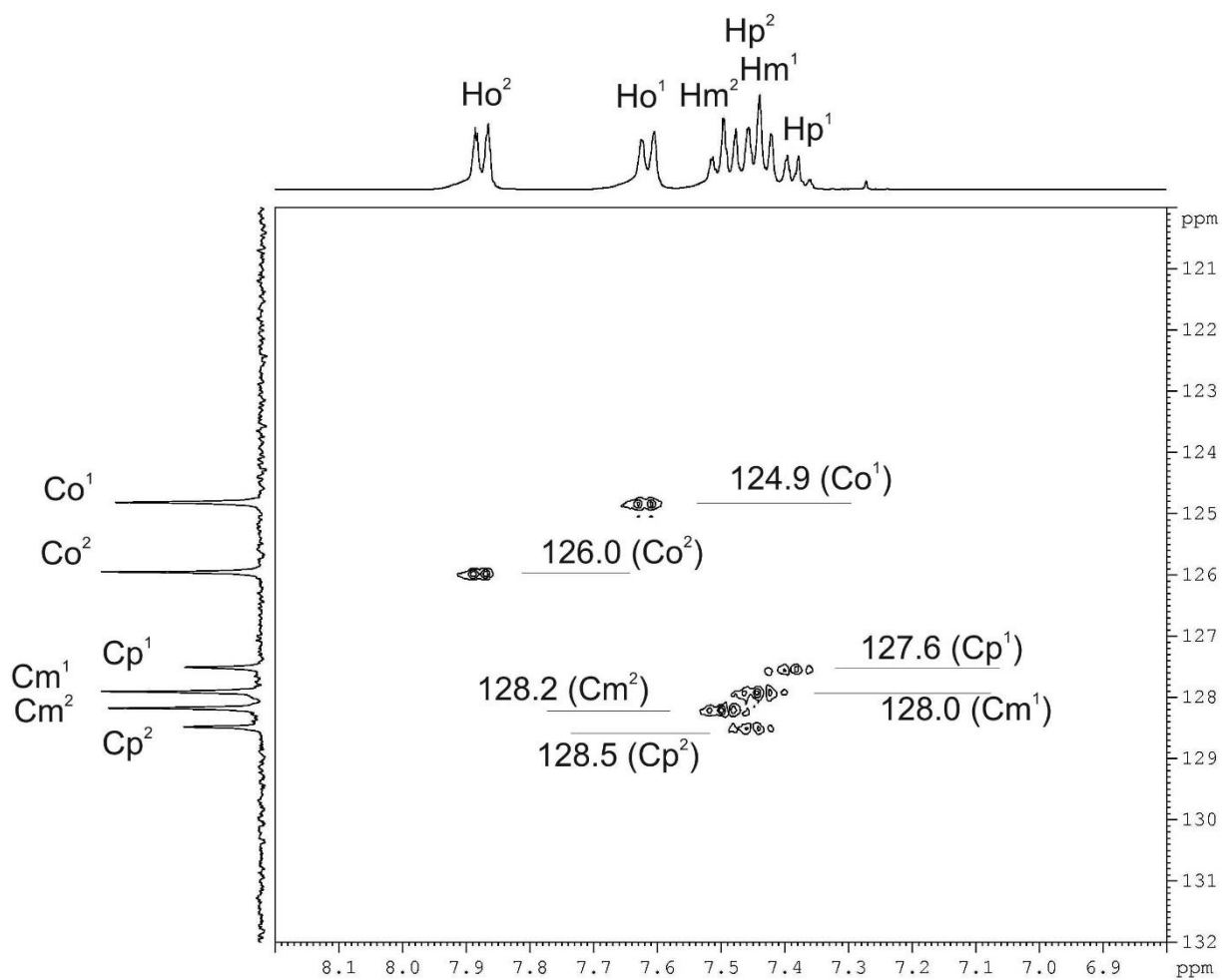


2D COSY Spectrum of (1*S**,3*S**,5*R**,7*R**)-5aa (aromatic region) (400.1 MHz, CDCl₃)

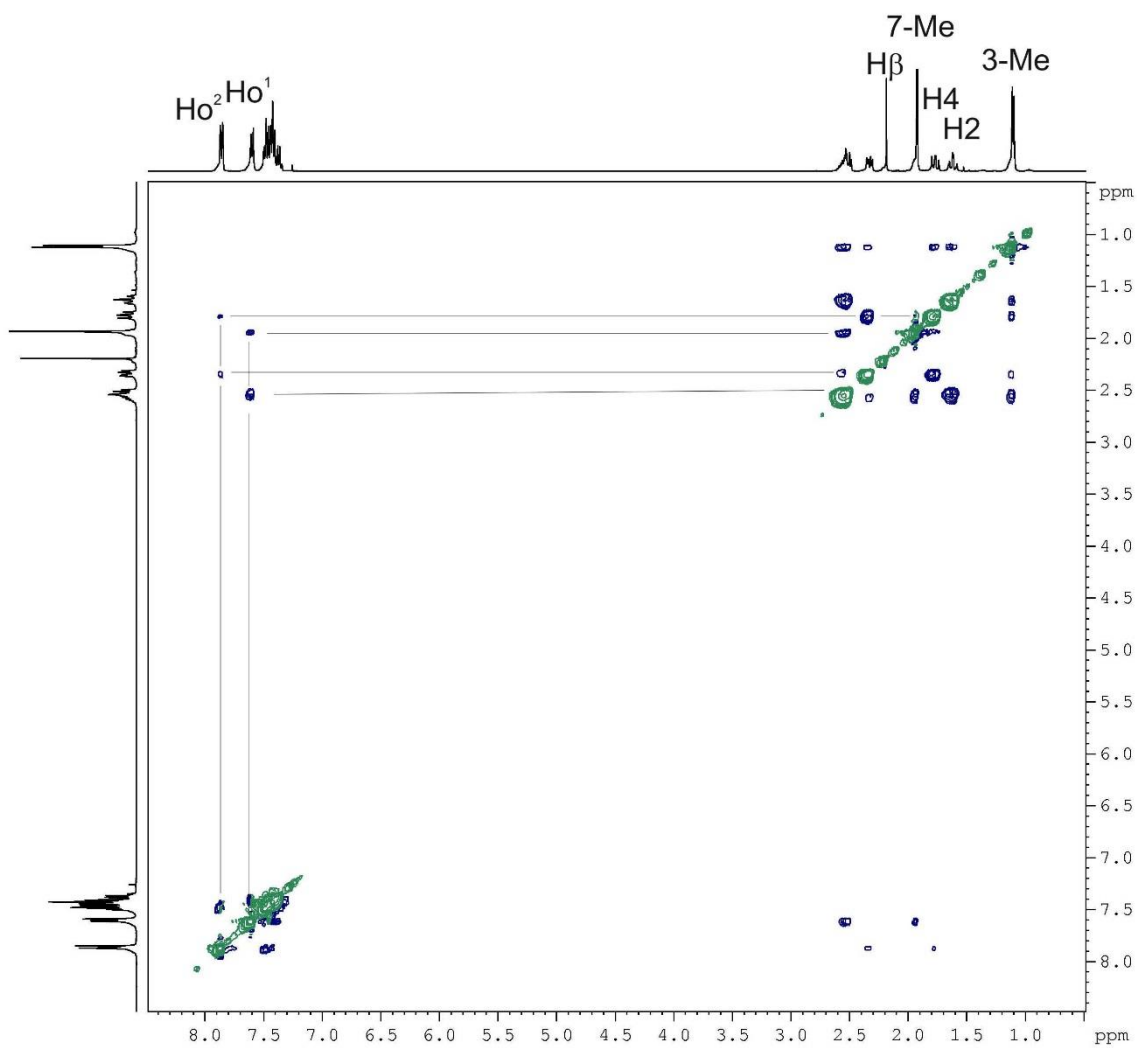


2D ^1H - ^{13}C HMBC Spectrum of (1*S**,3*S**,5*R**,7*R**)-5aa.

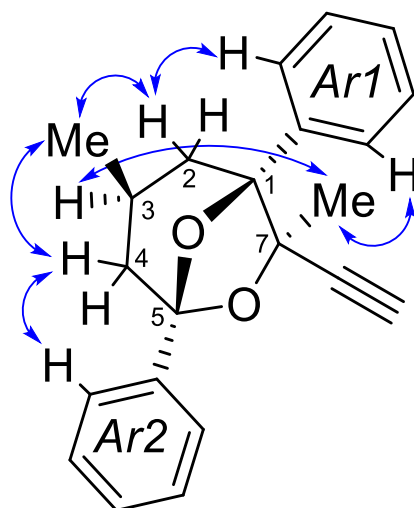


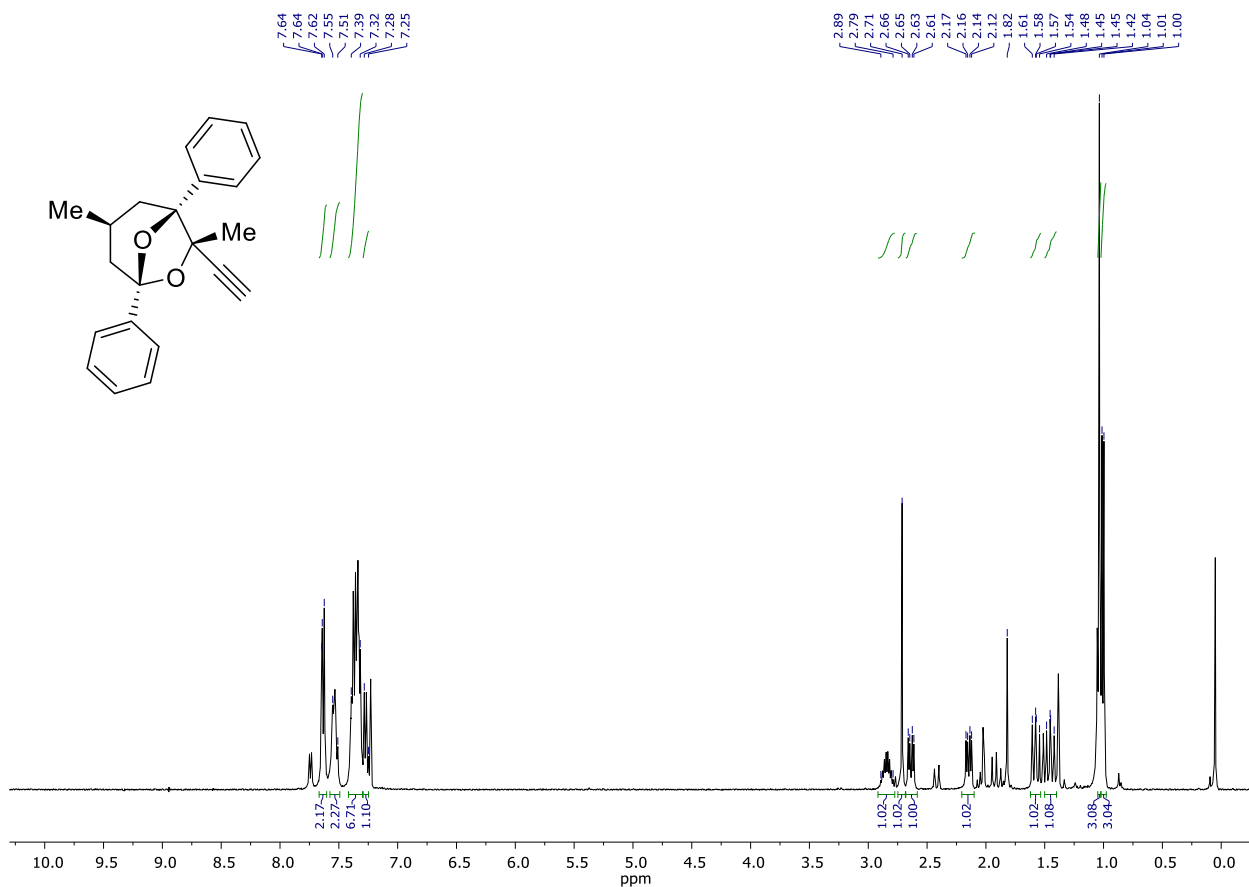


2D ^1H - ^{13}C HSQC Spectrum of (1*S**,3*S**,5*R**,7*R**)-5aa (aromatic region)

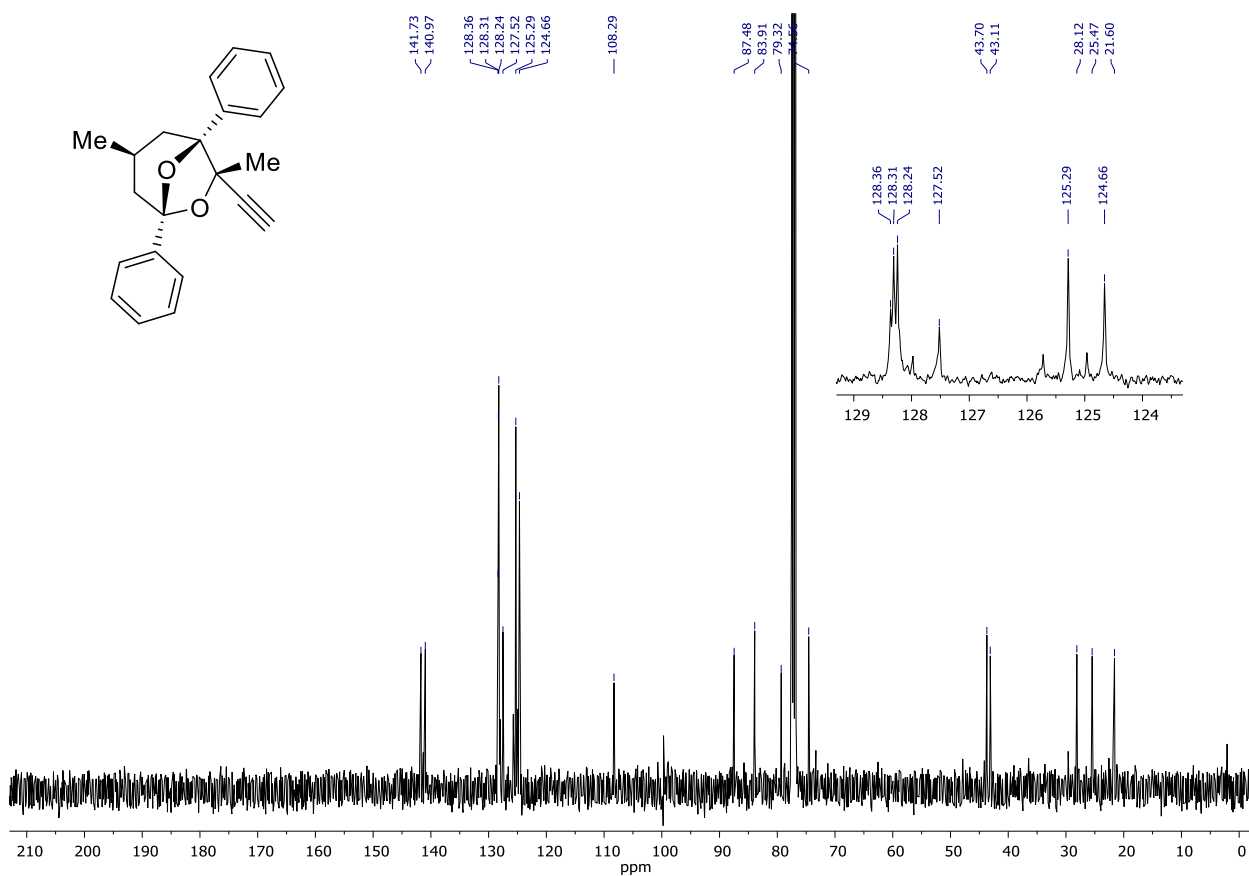


2D NOESY Spectrum of (1*S**,3*S**,5*R**,7*R**)-5aa (400.1 MHz, CDCl₃)

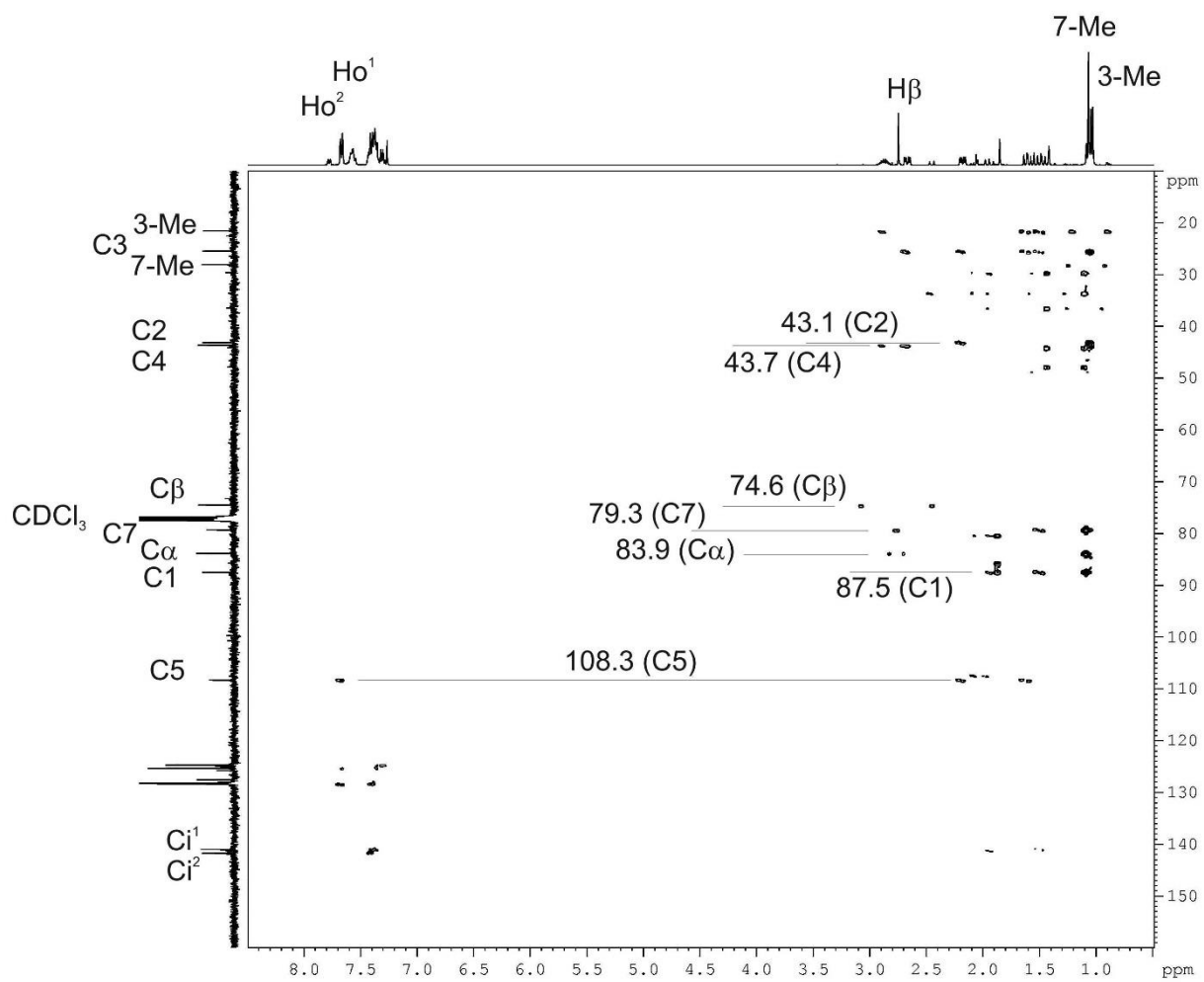


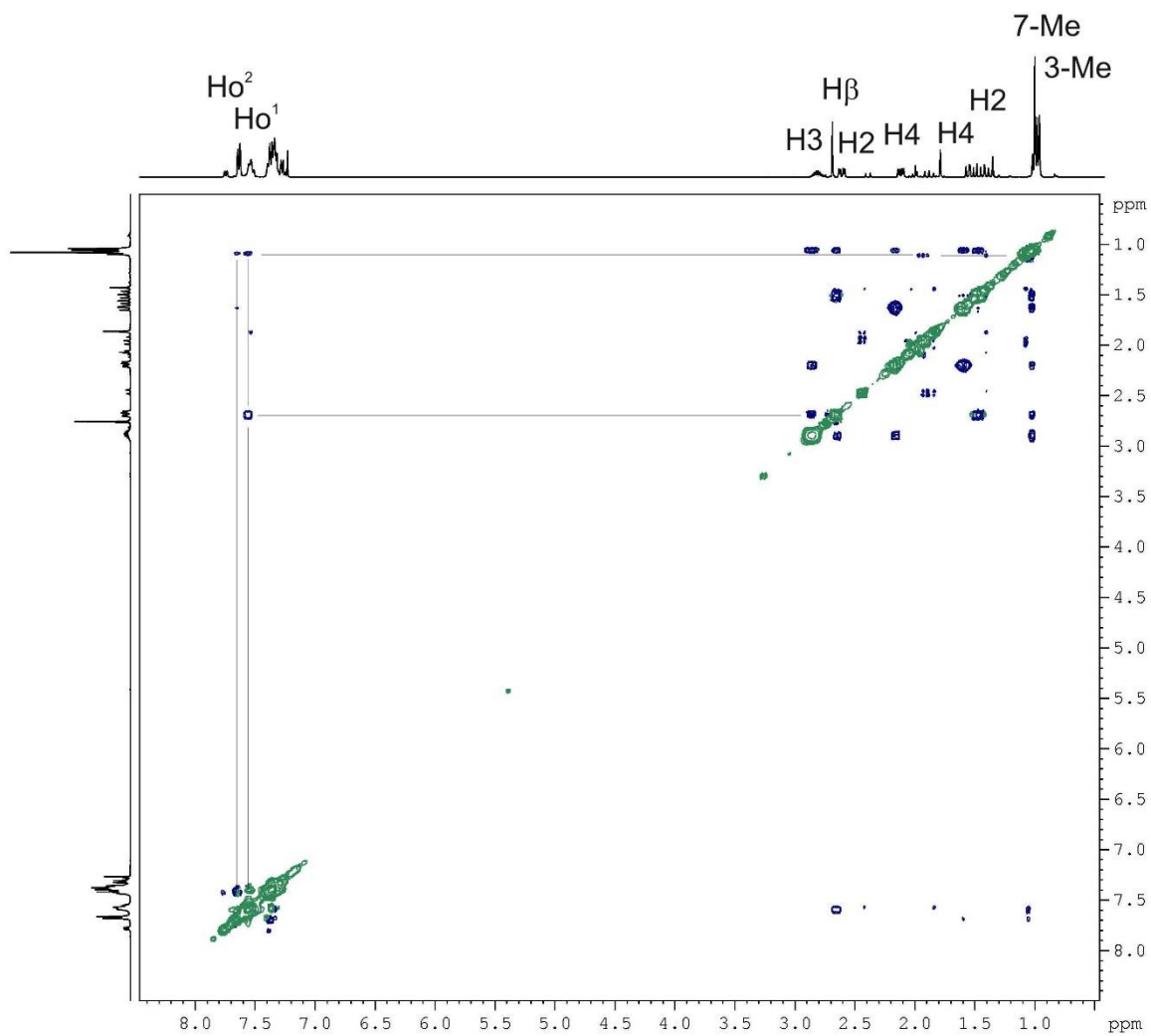


¹H NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5aa (400.1 MHz, CDCl₃)**

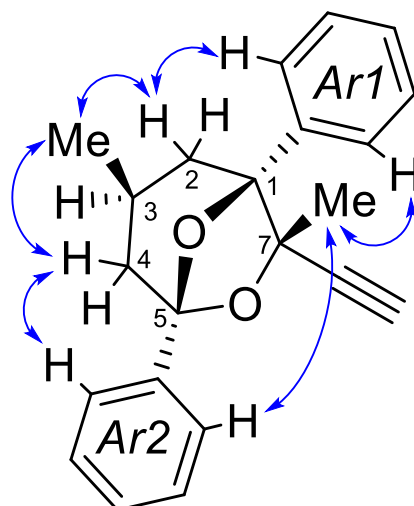


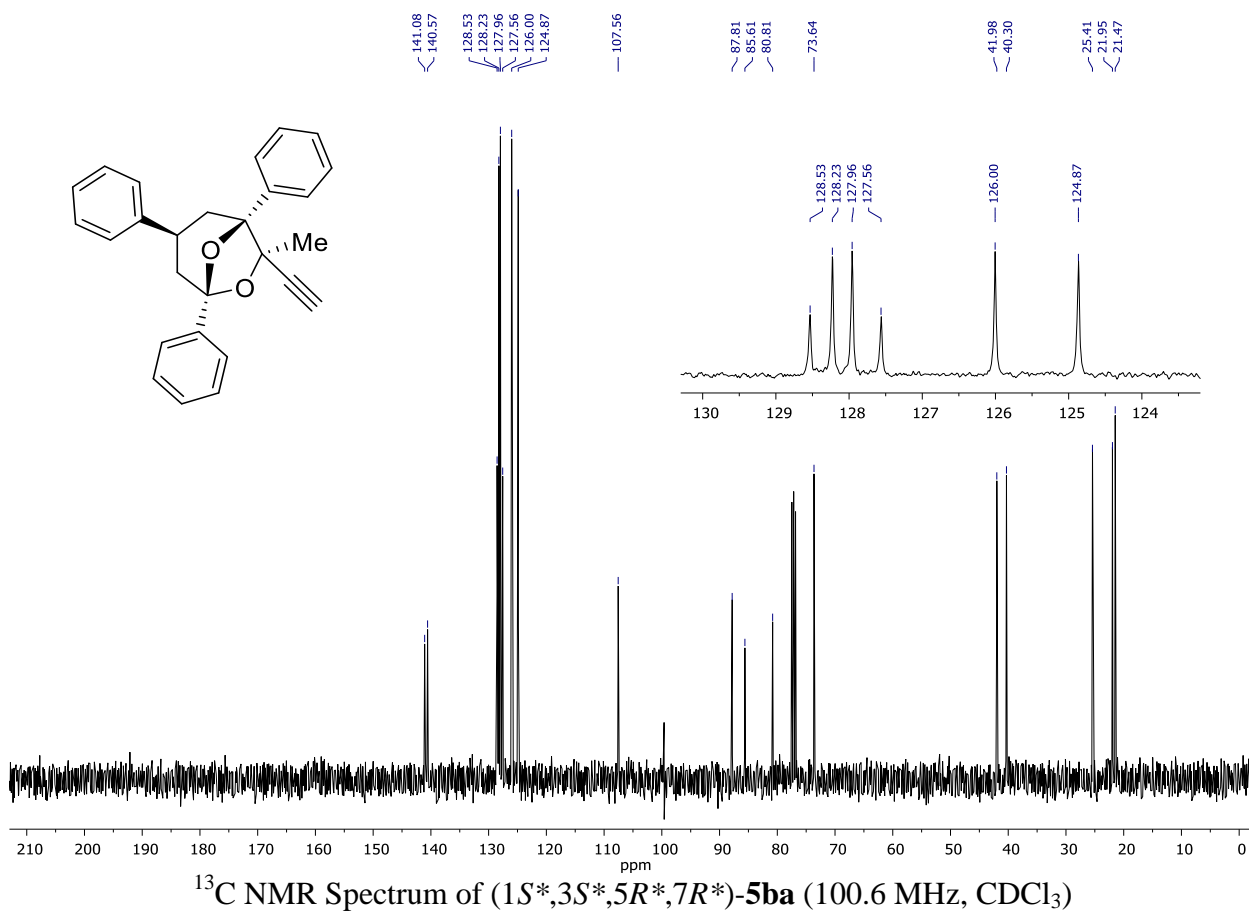
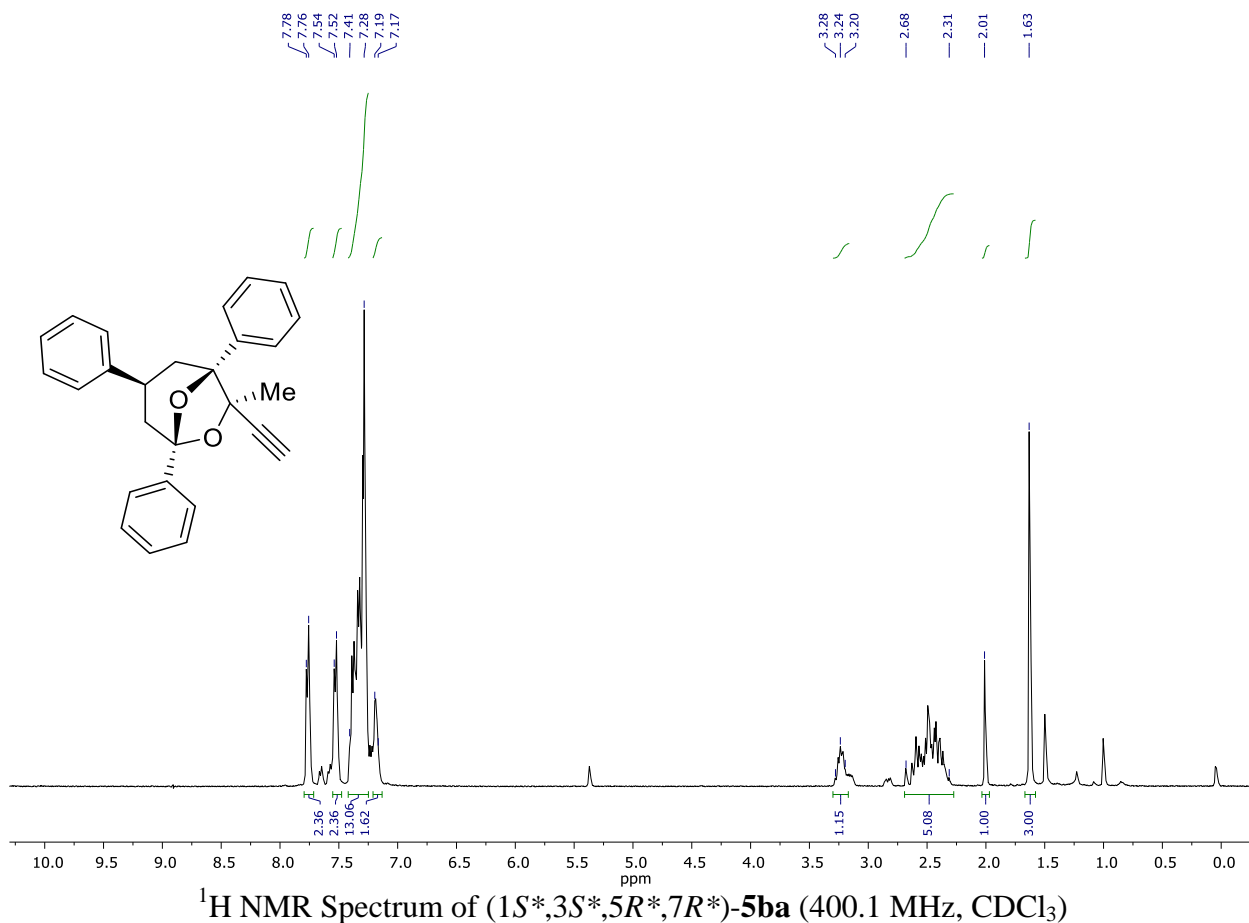
¹³C NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5aa (100.6 MHz, CDCl₃)**

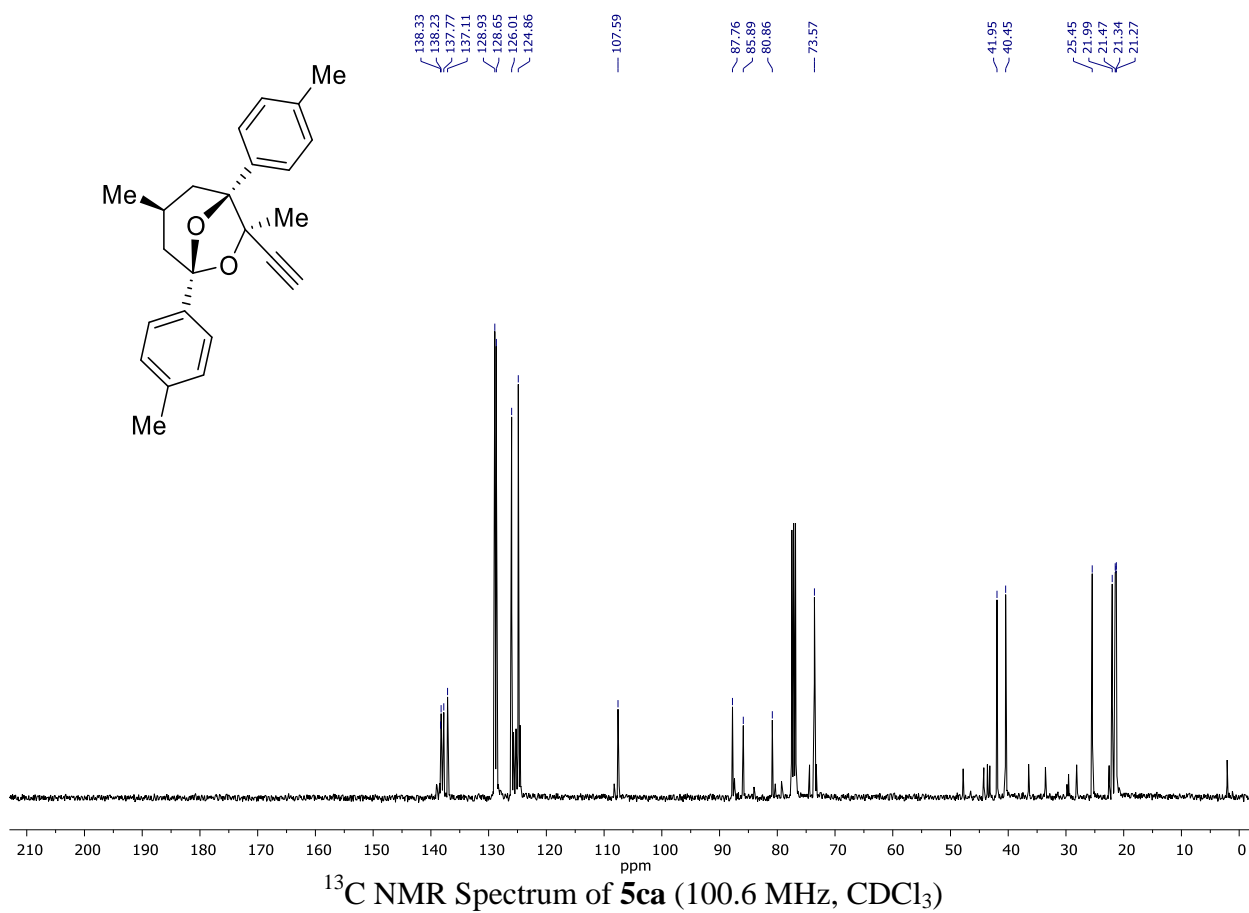
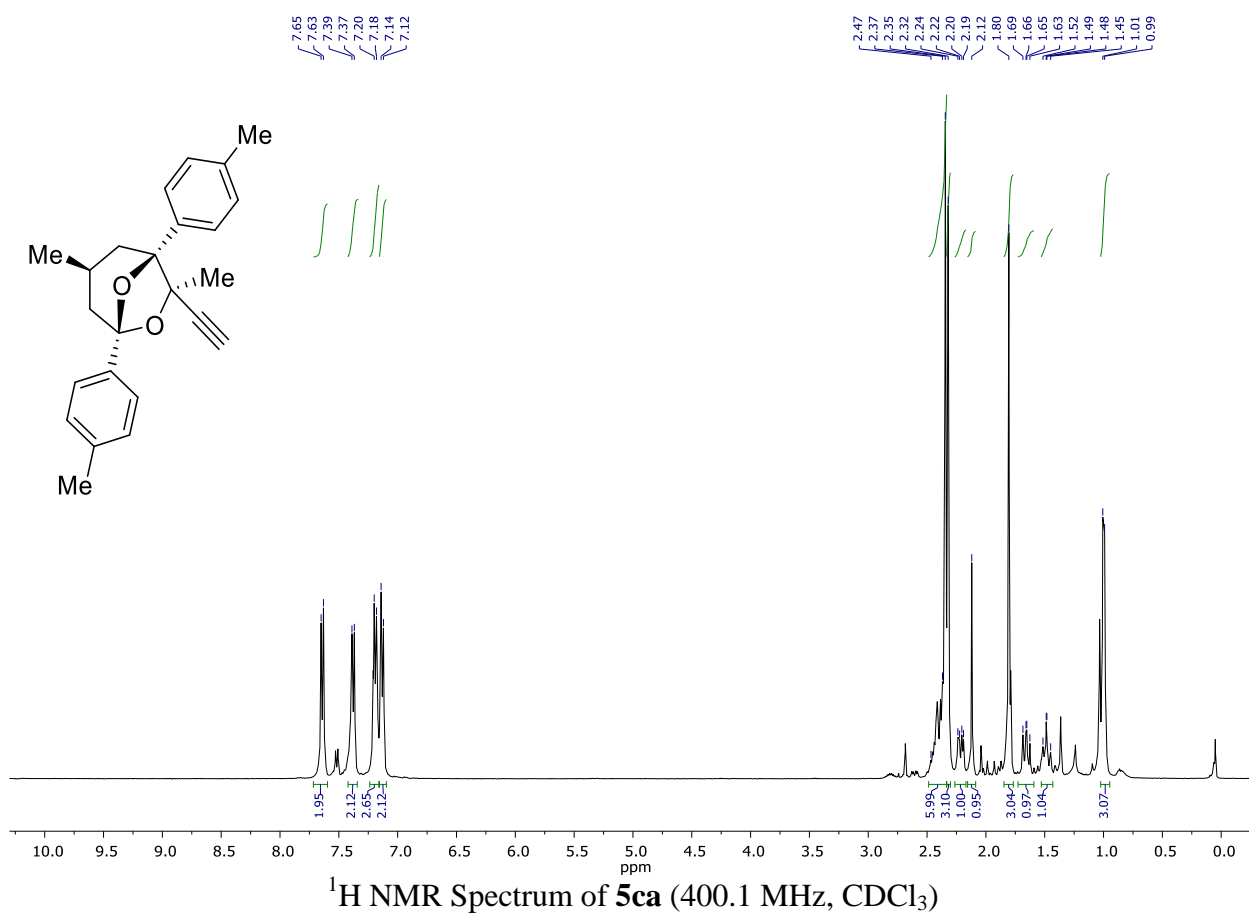


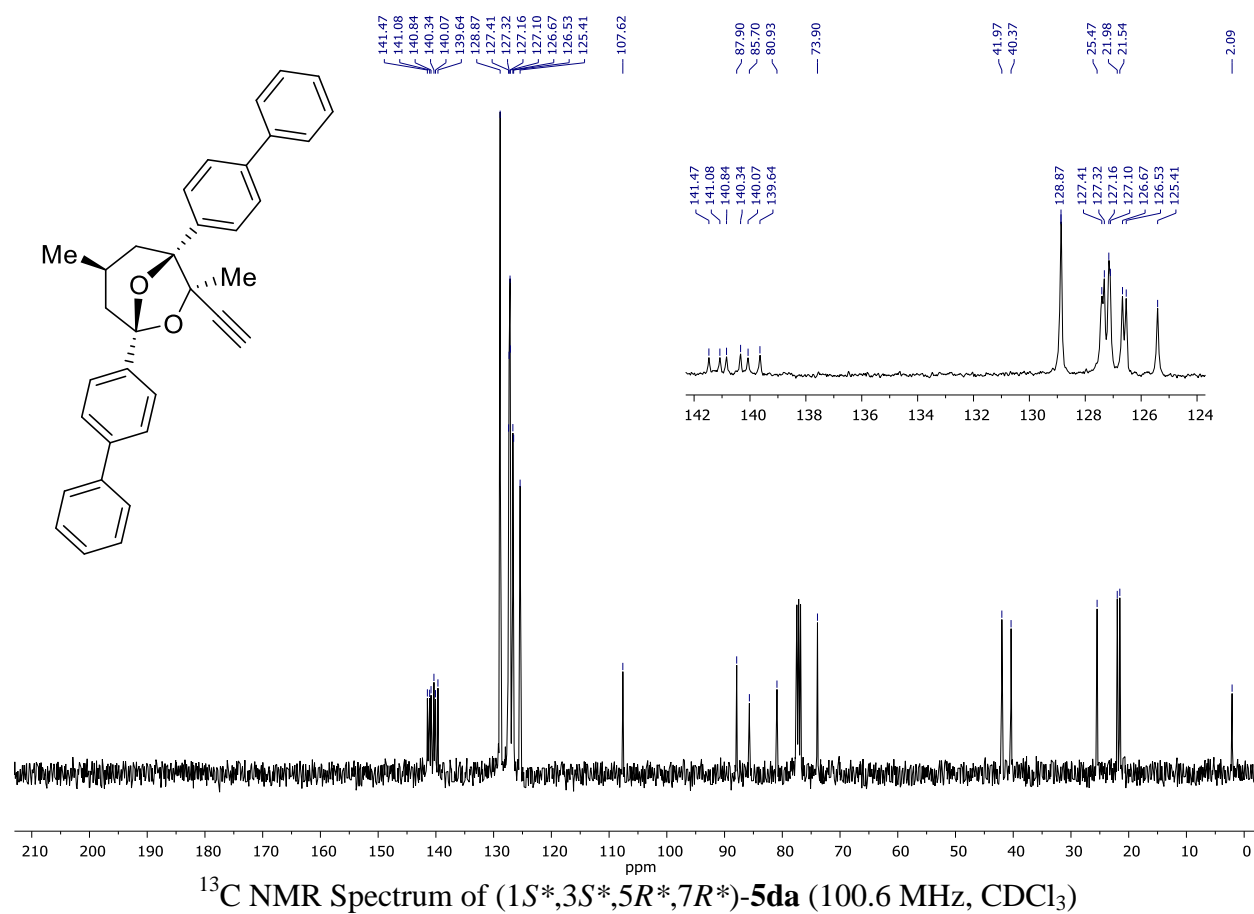
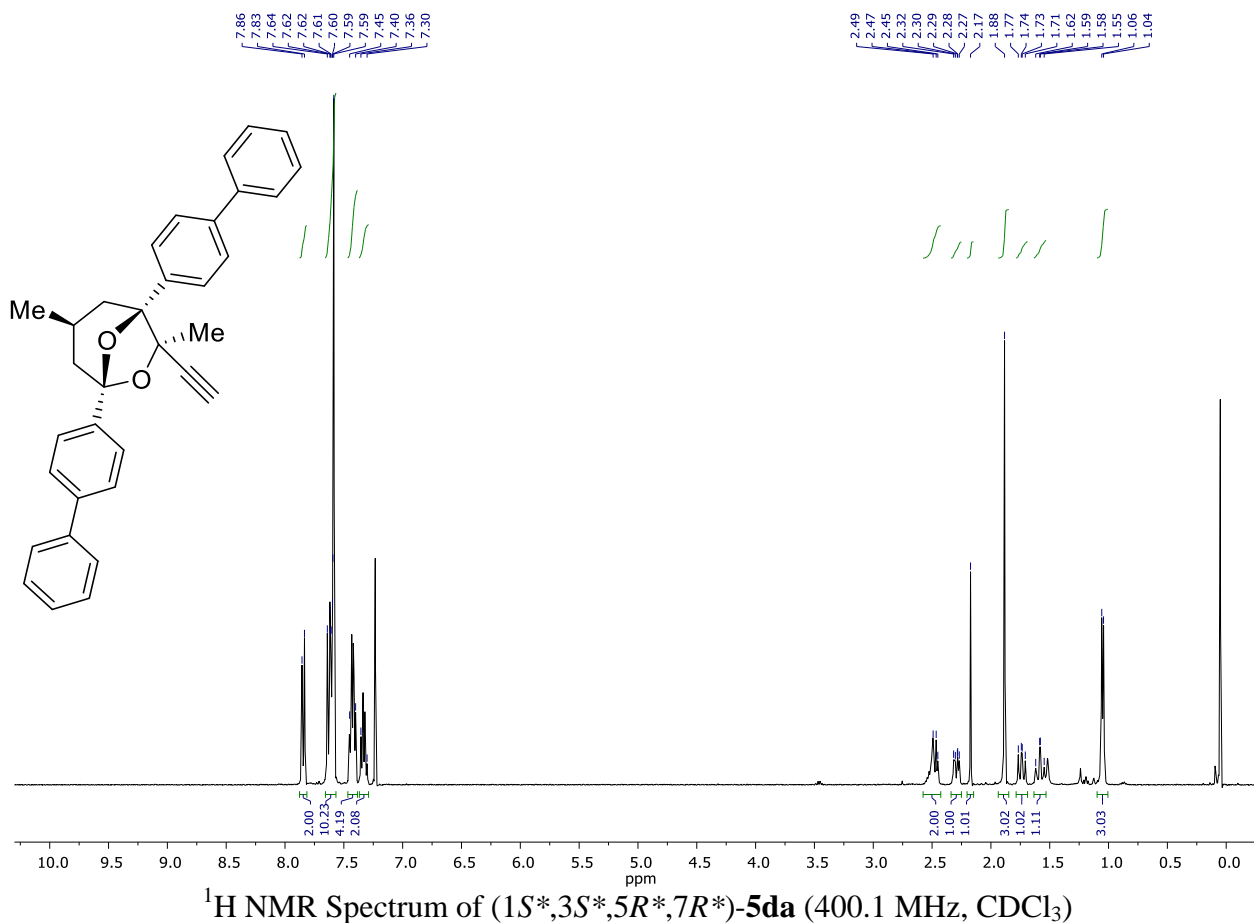


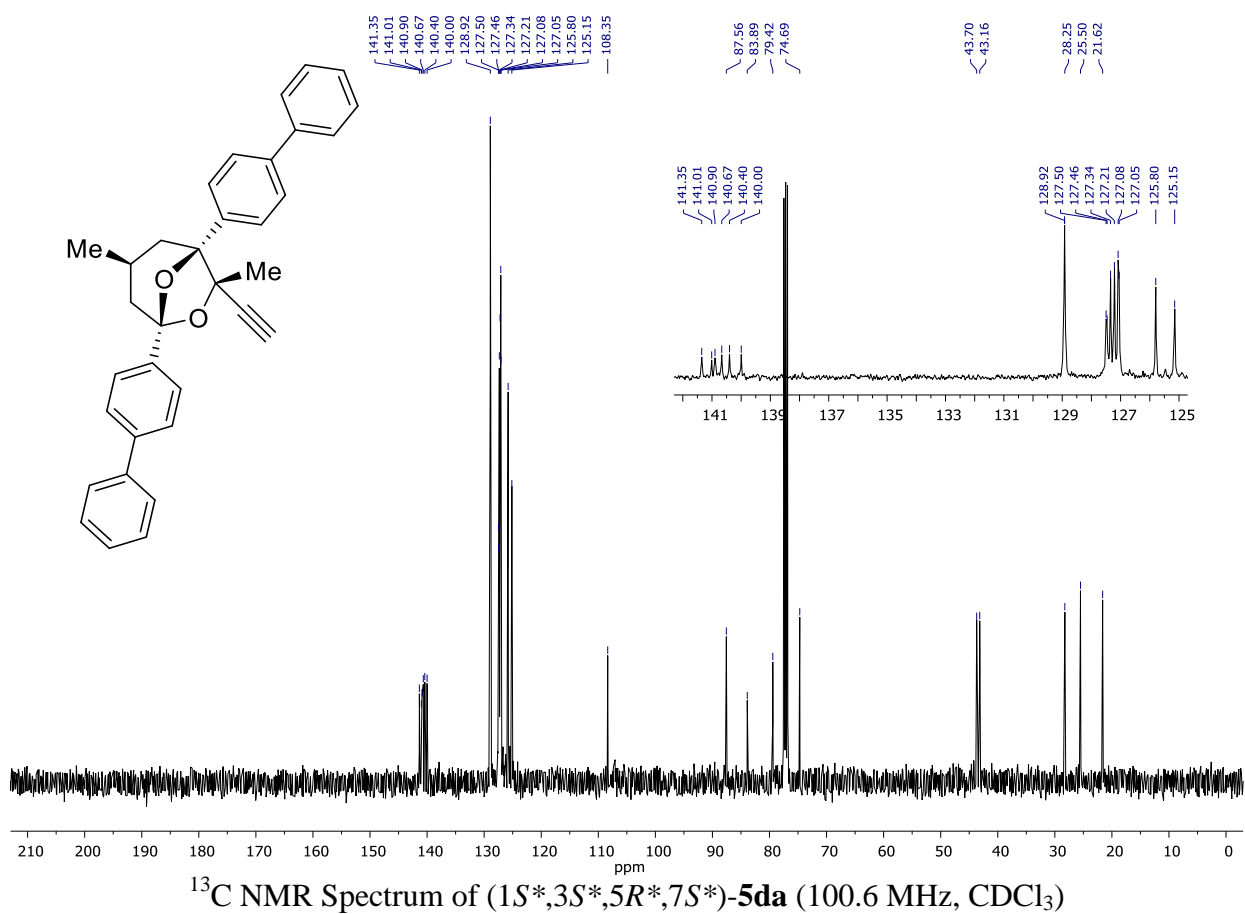
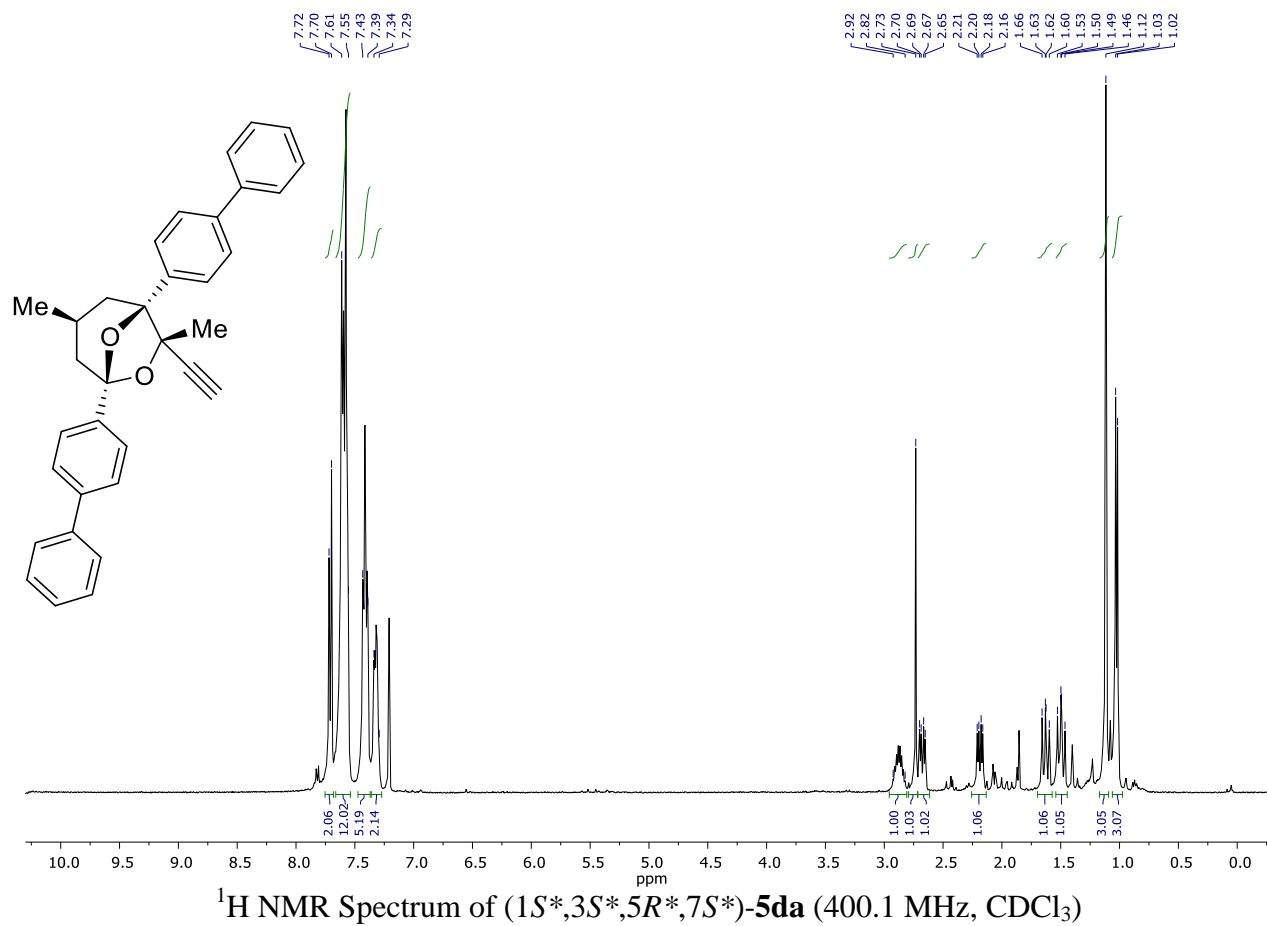
2D NOESY Spectrum of (1*S**,3*S**,5*R**,7*S**)-**5aa** (400.1 MHz, CDCl₃)

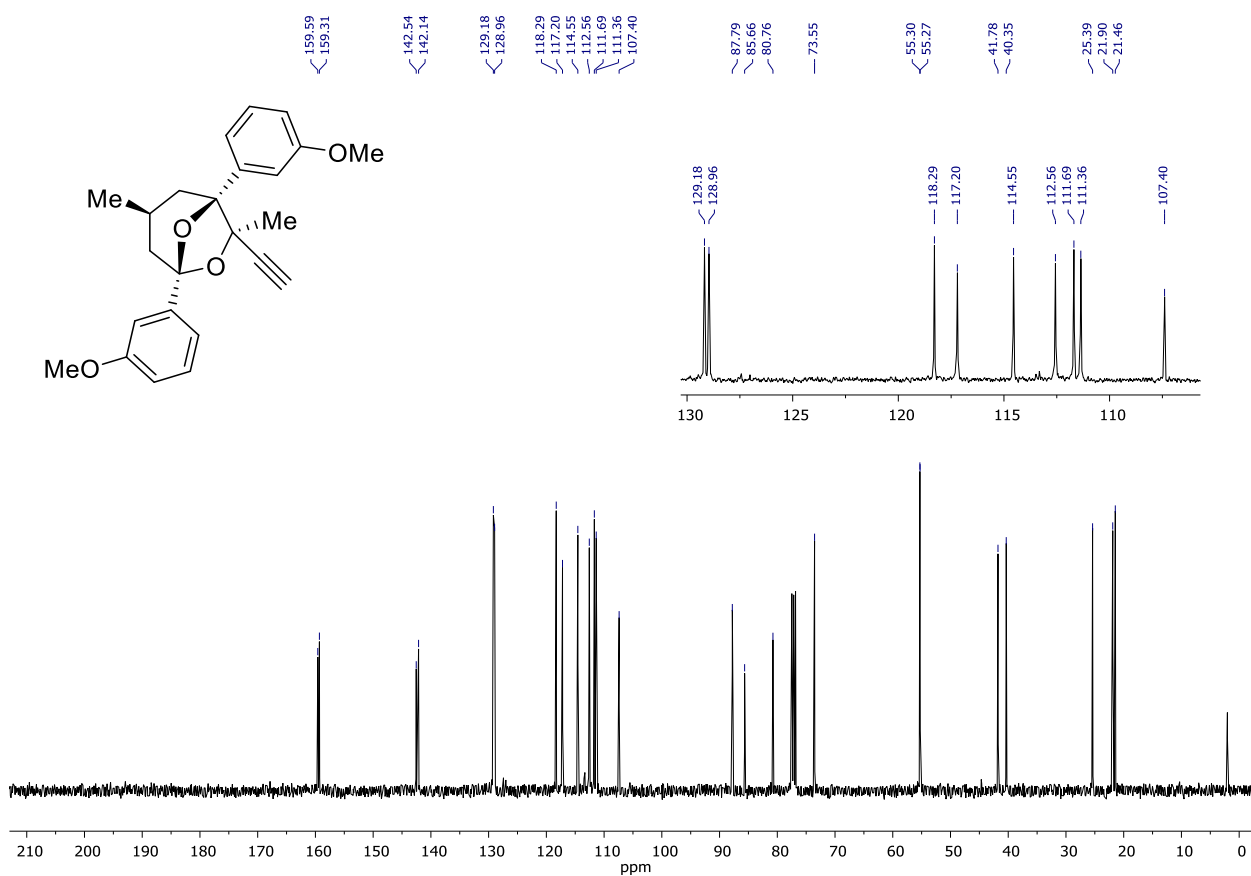
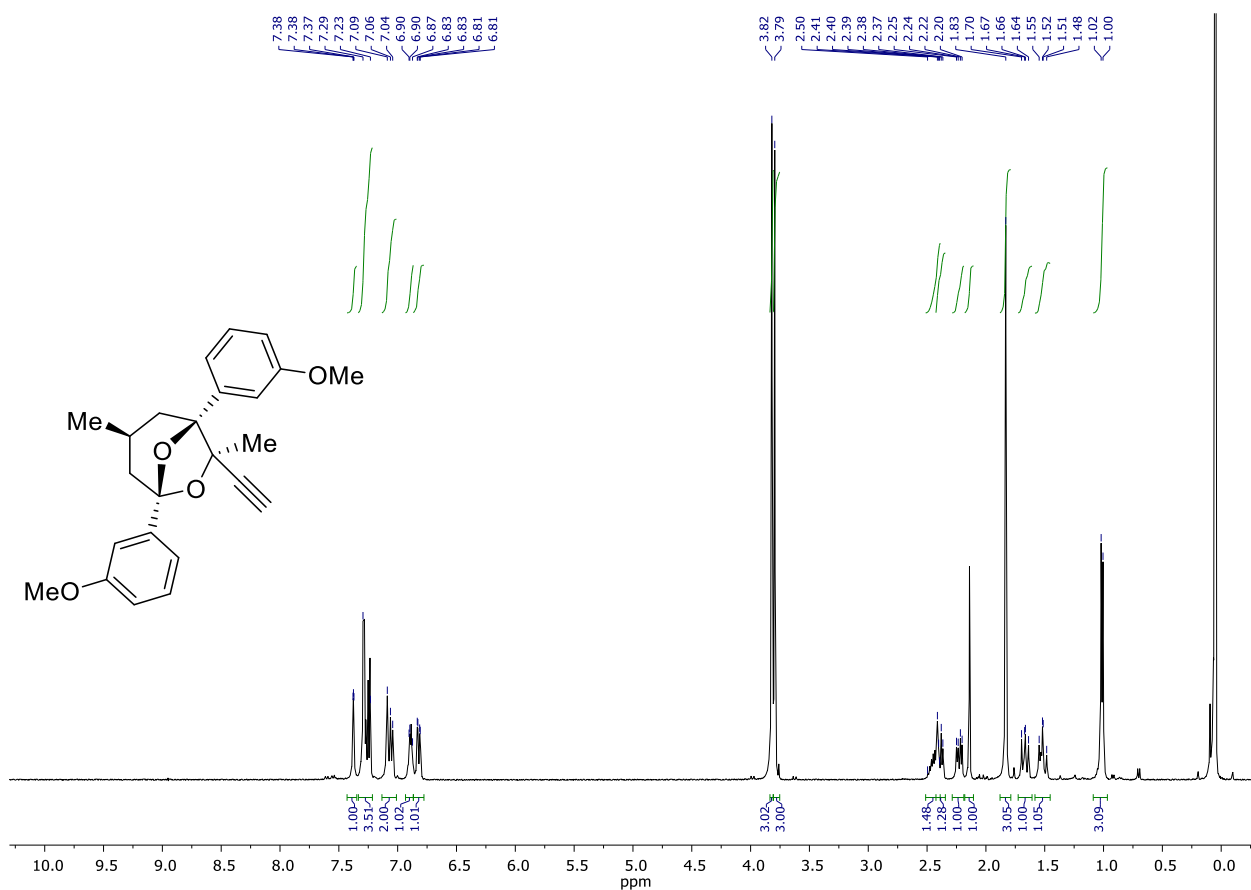


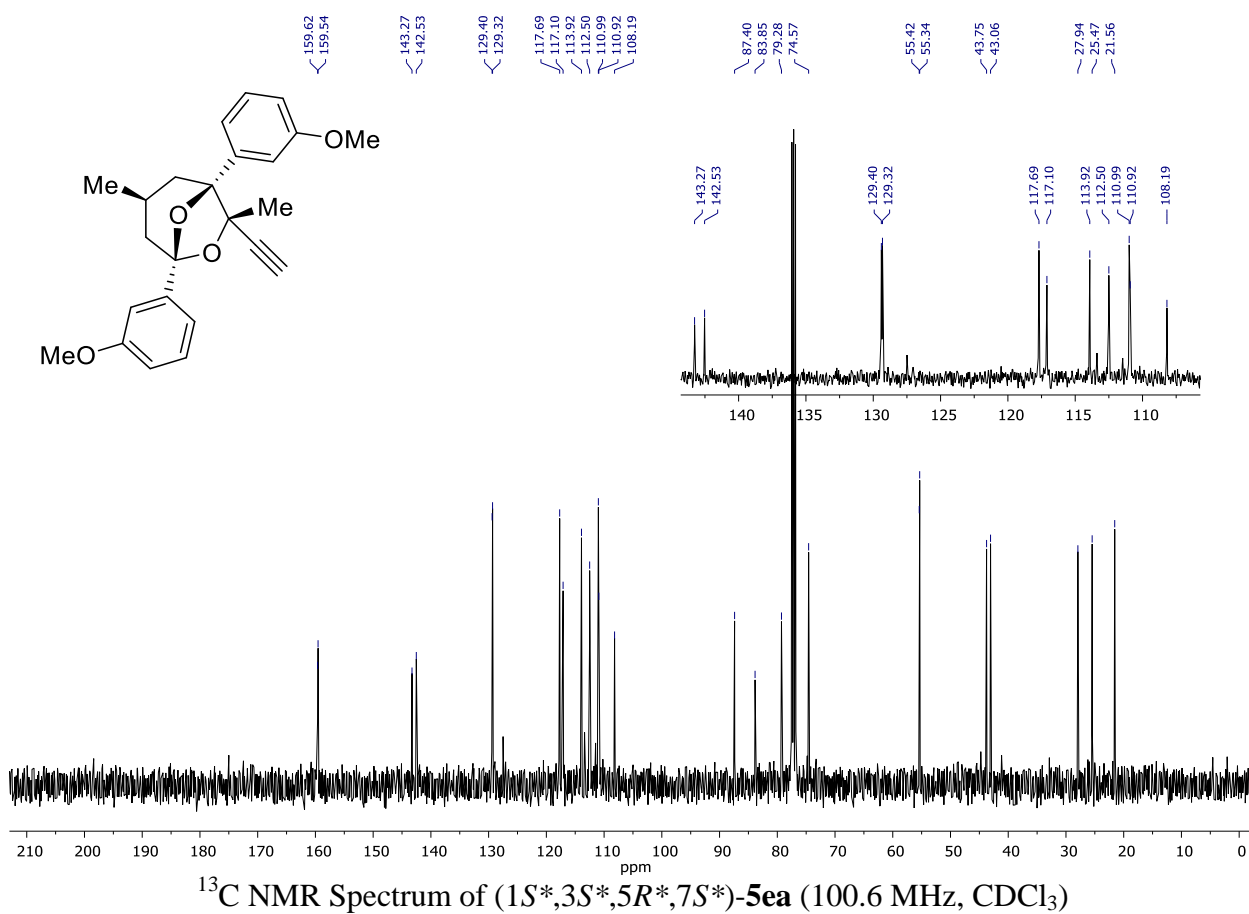
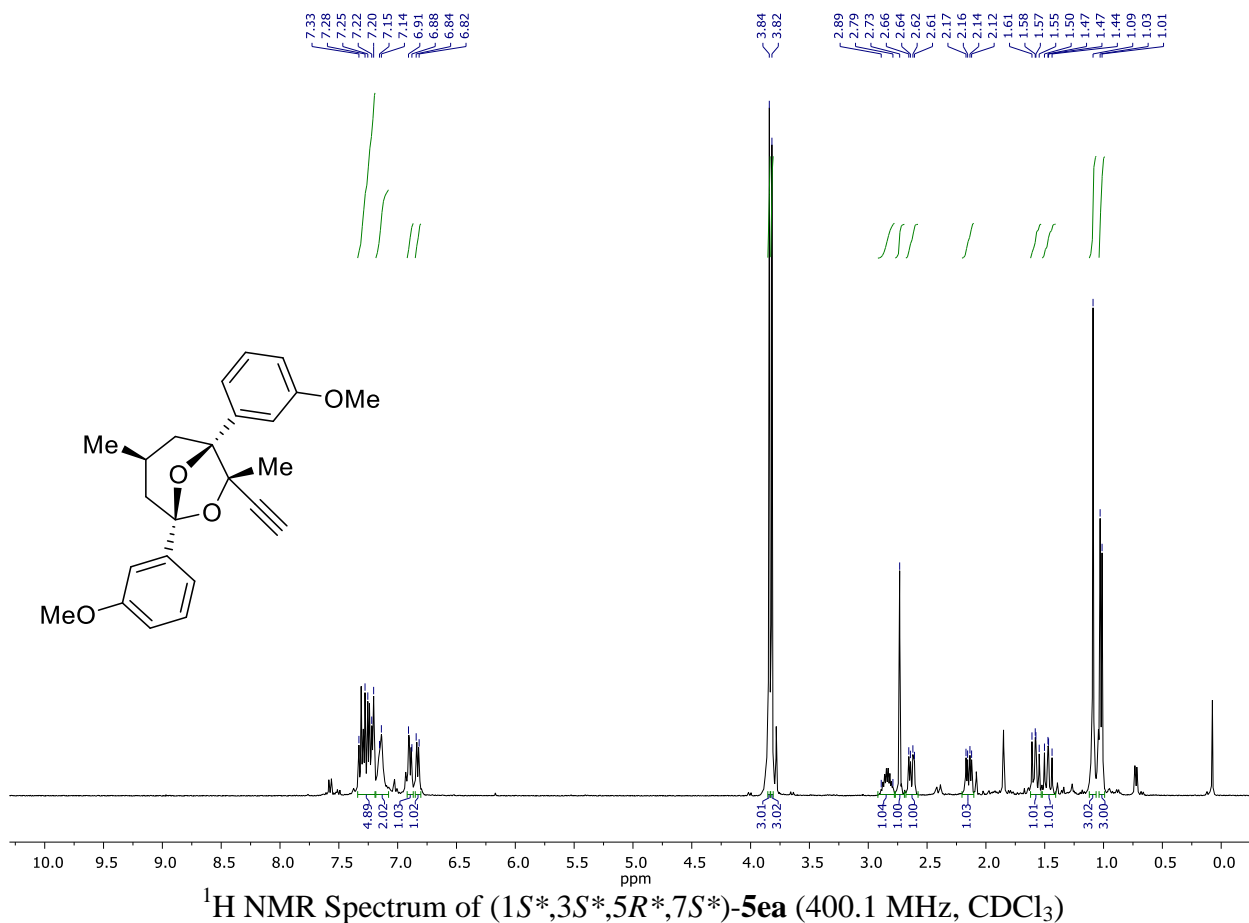


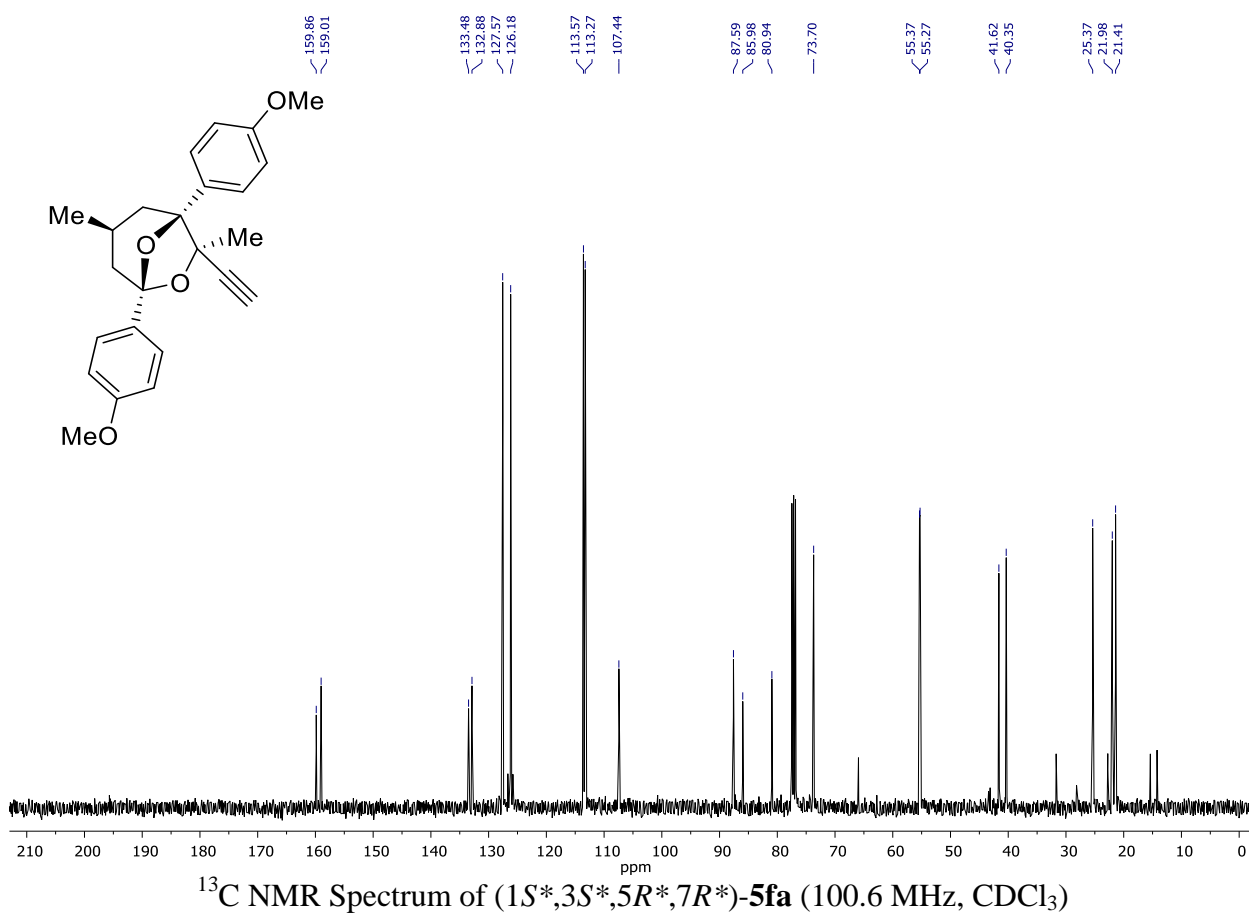
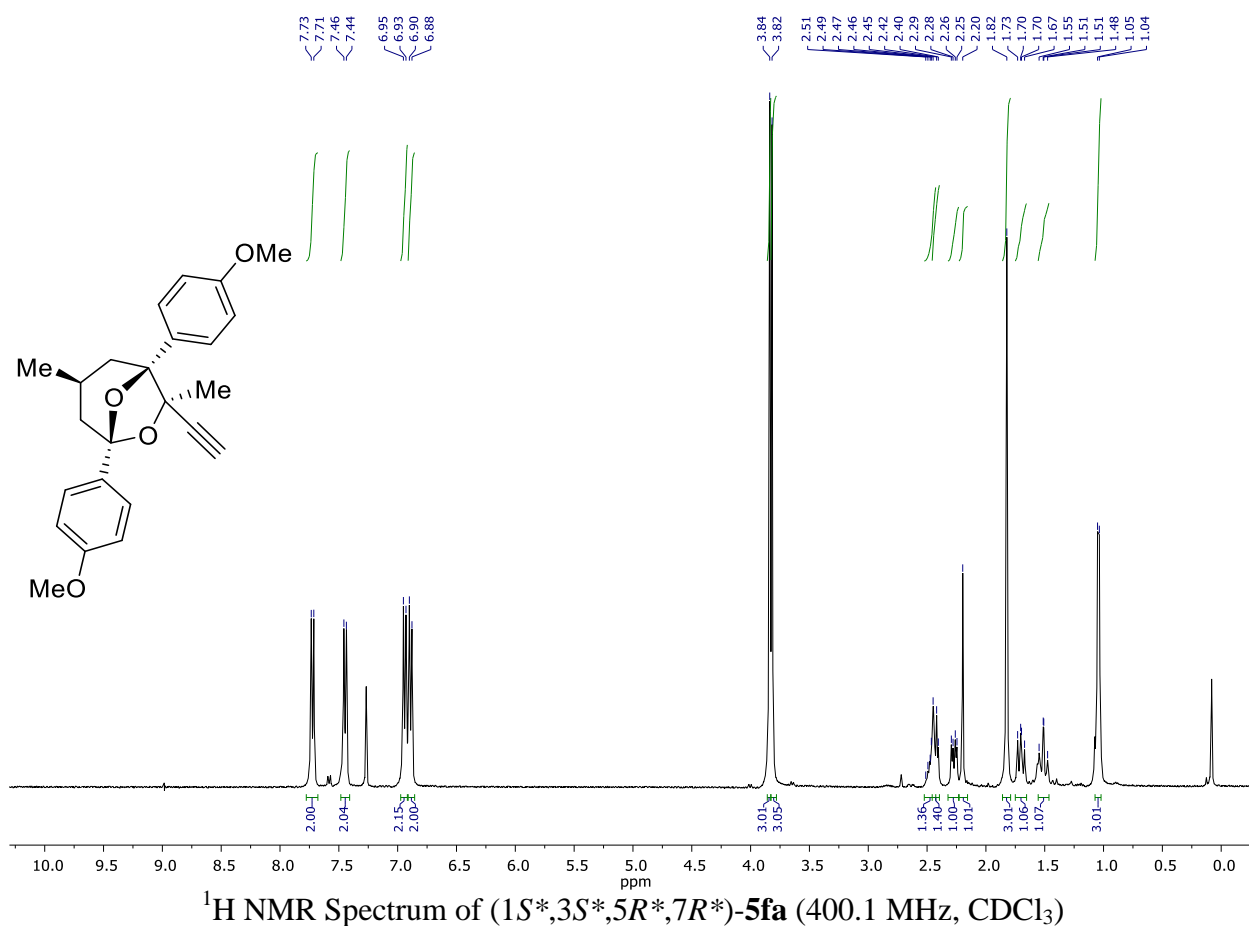


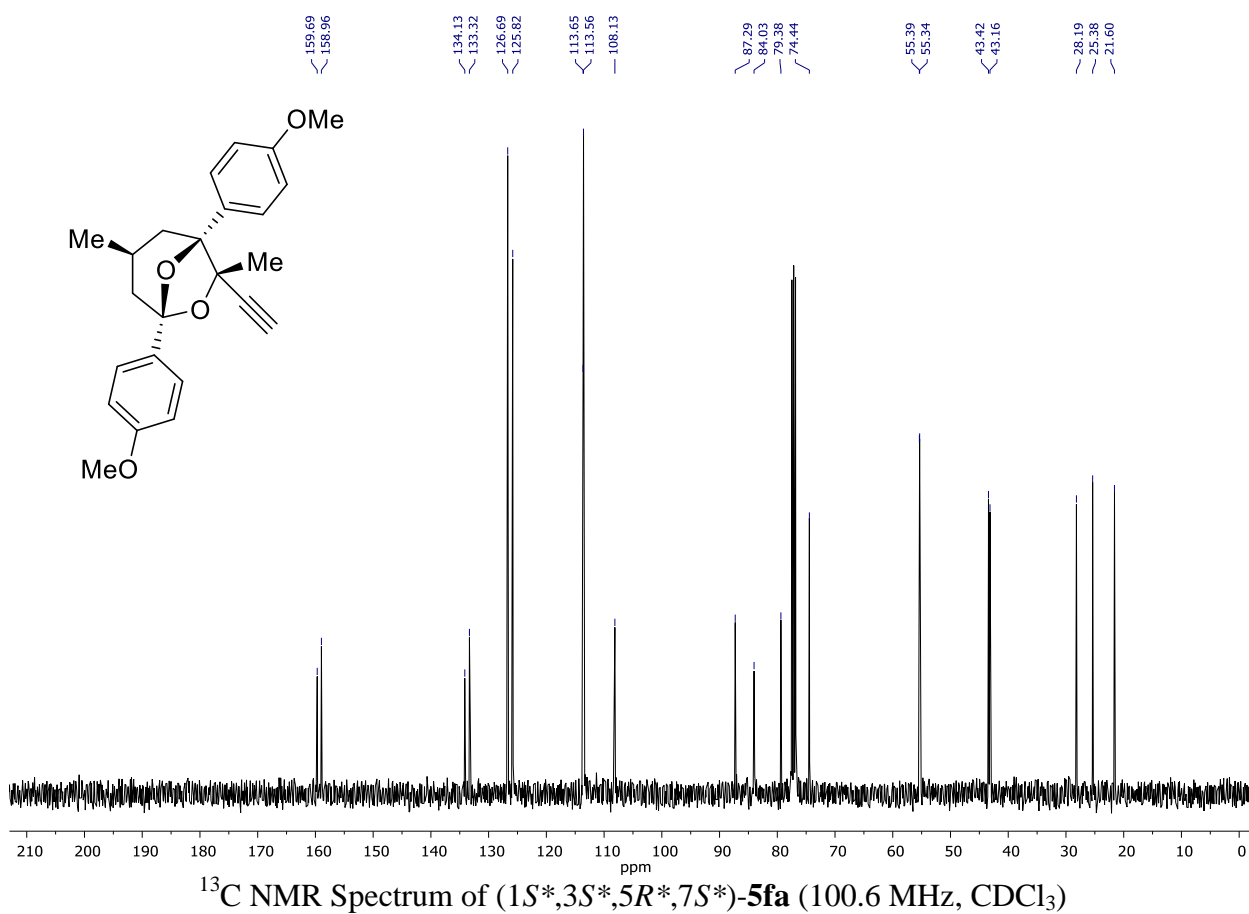
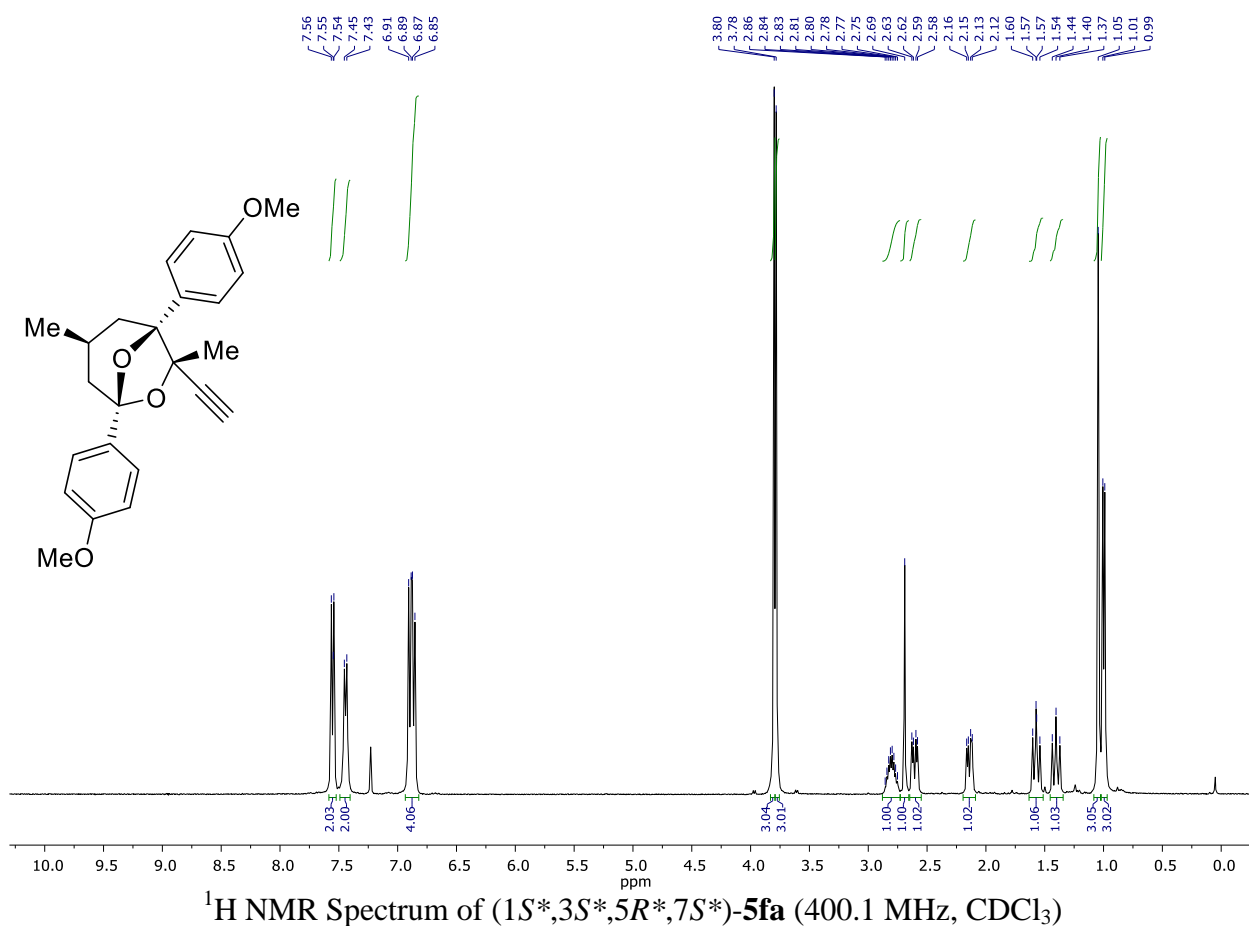


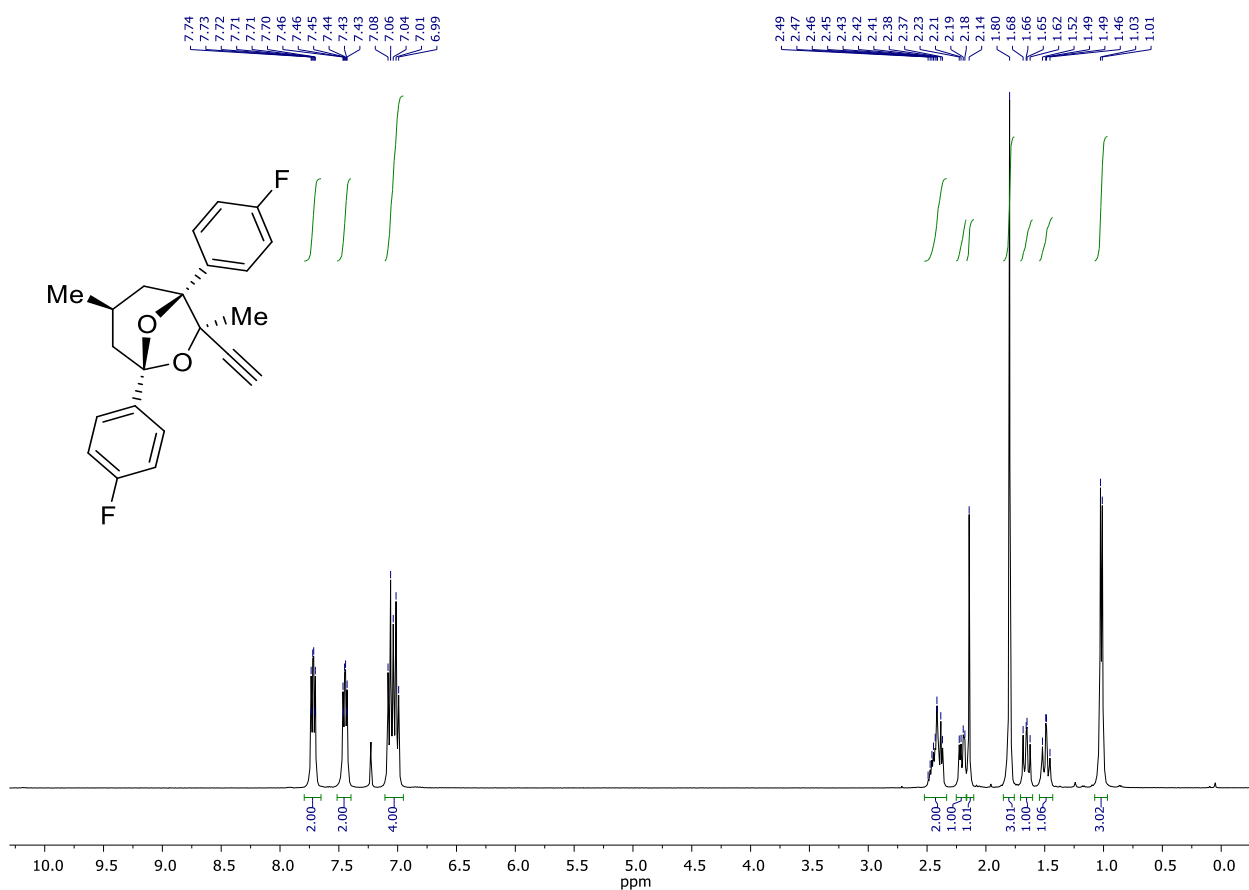




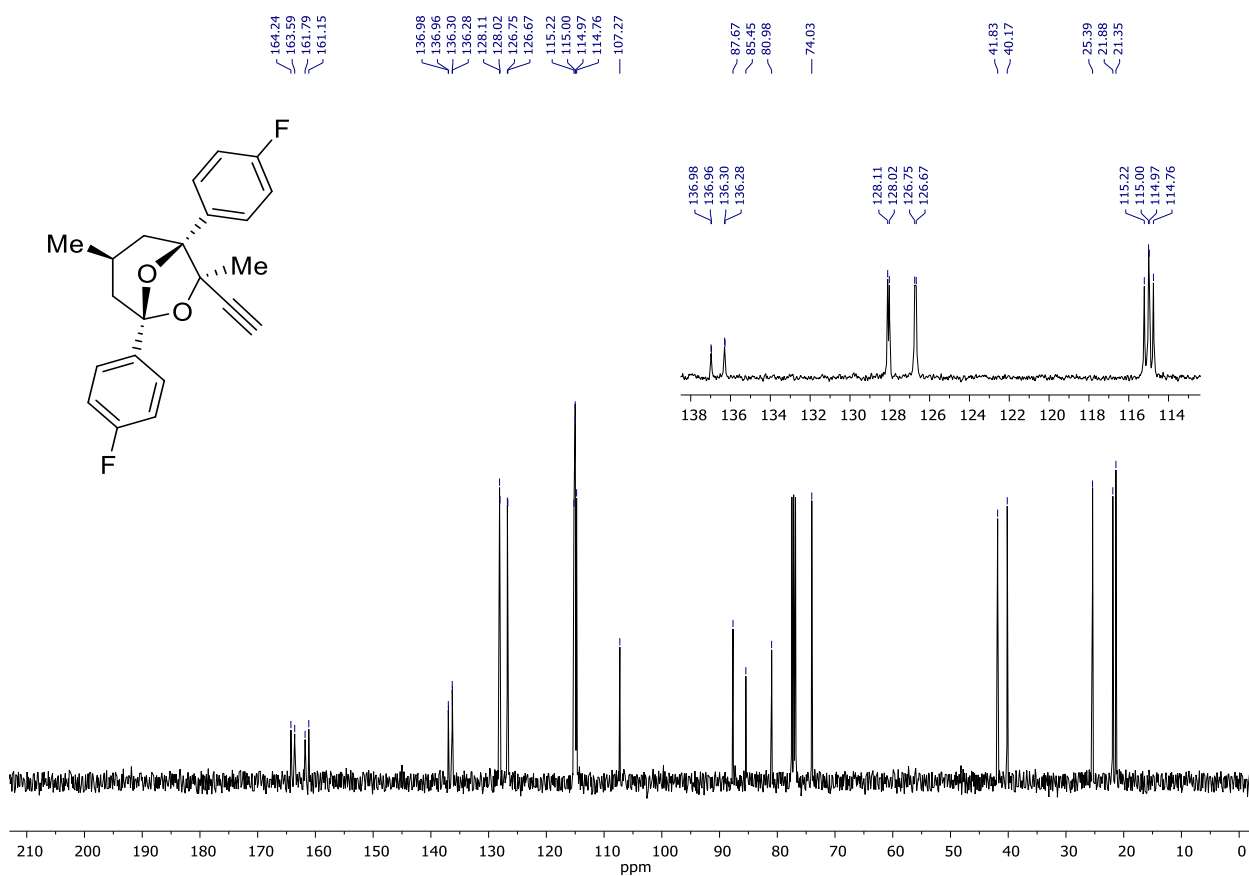




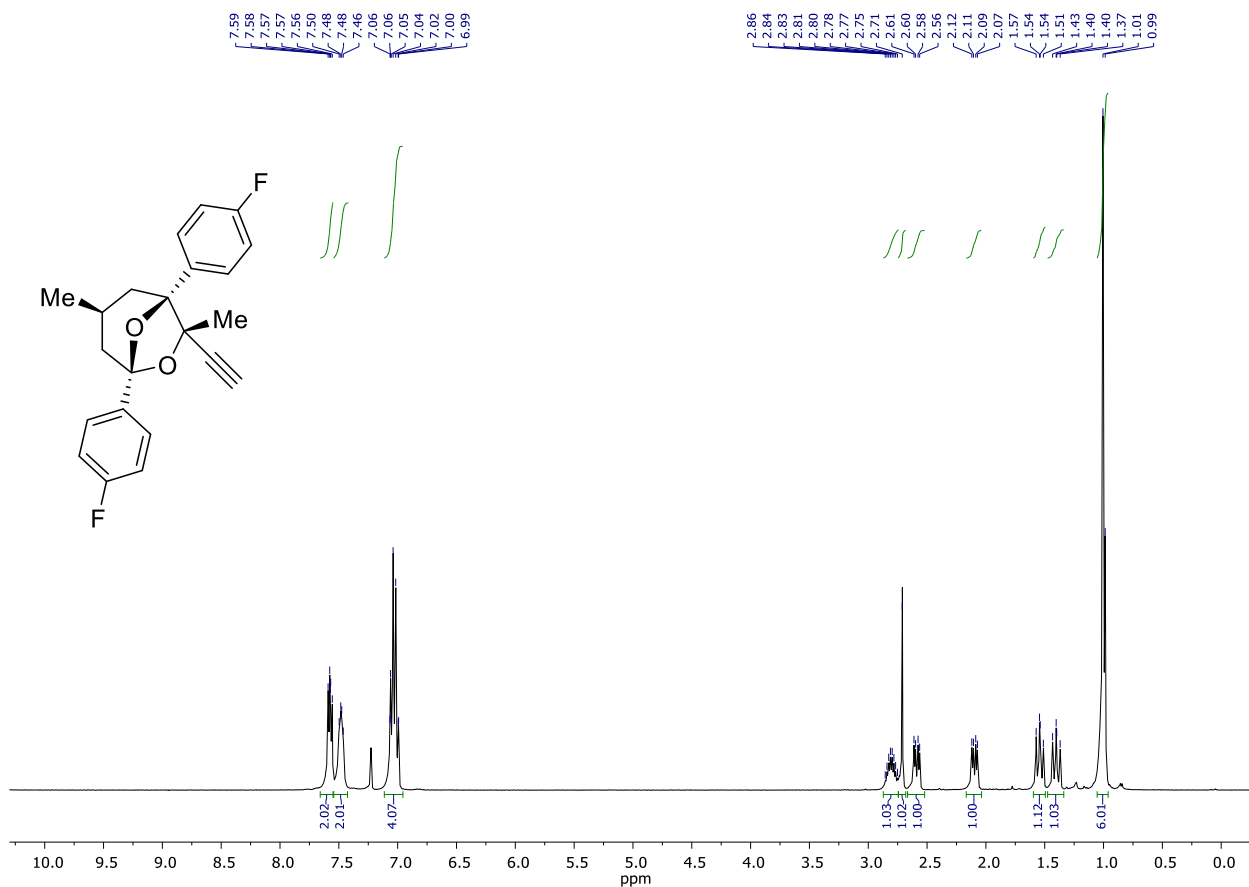




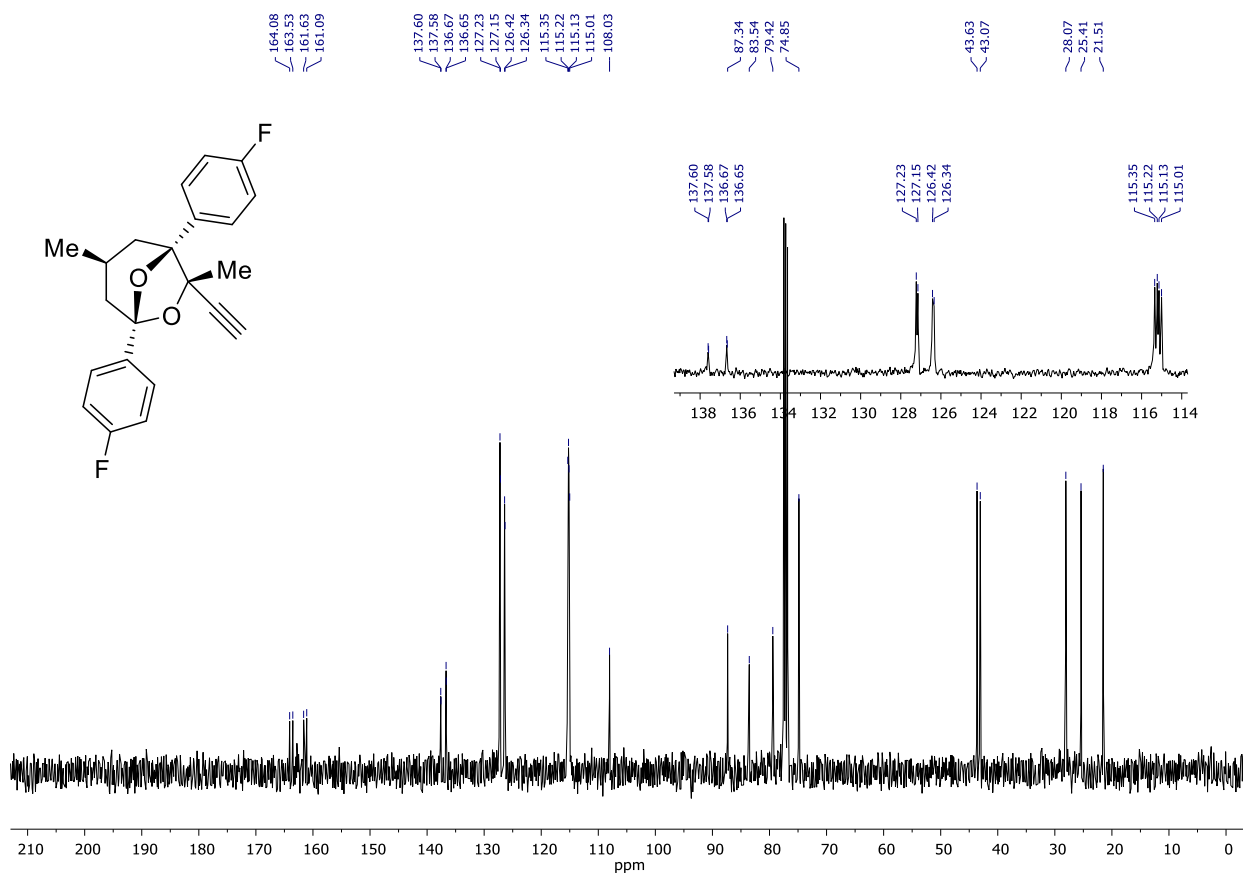
$^1\text{H NMR}$ Spectrum of $(1S^*,3S^*,5R^*,7R^*)$ -**5ga** (400.1 MHz, CDCl_3)



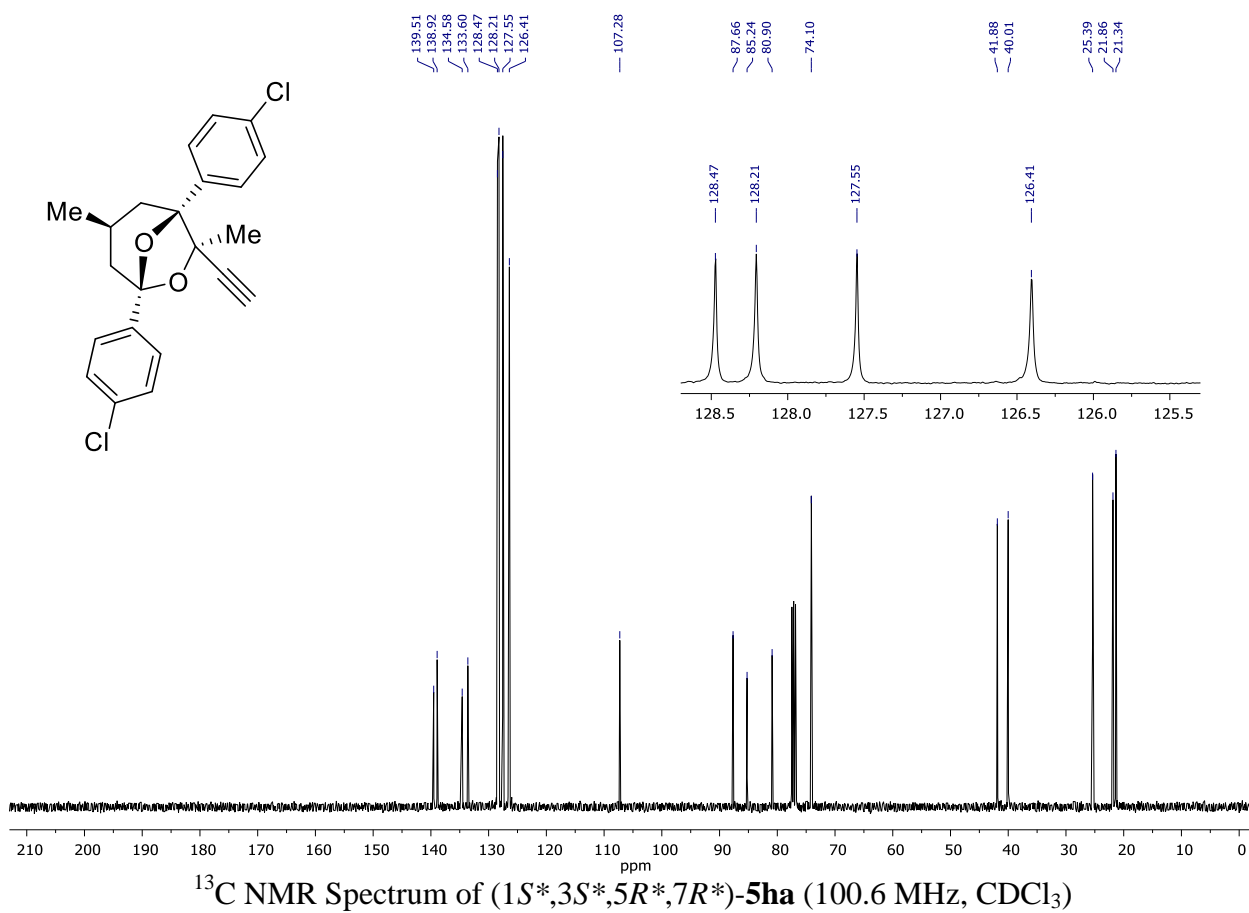
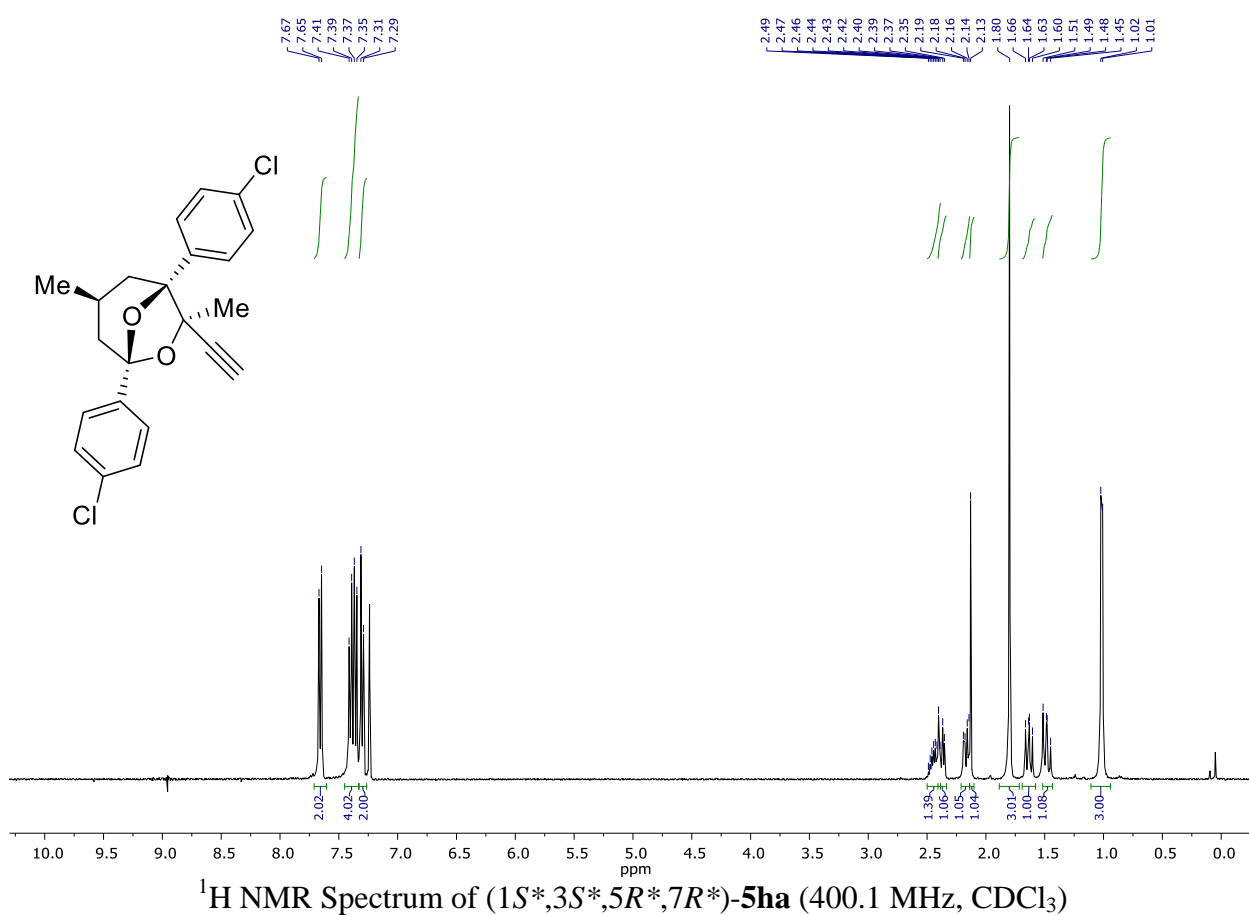
$^{13}\text{C NMR}$ Spectrum of $(1S^*,3S^*,5R^*,7R^*)$ -**5ga** (100.6 MHz, CDCl_3)

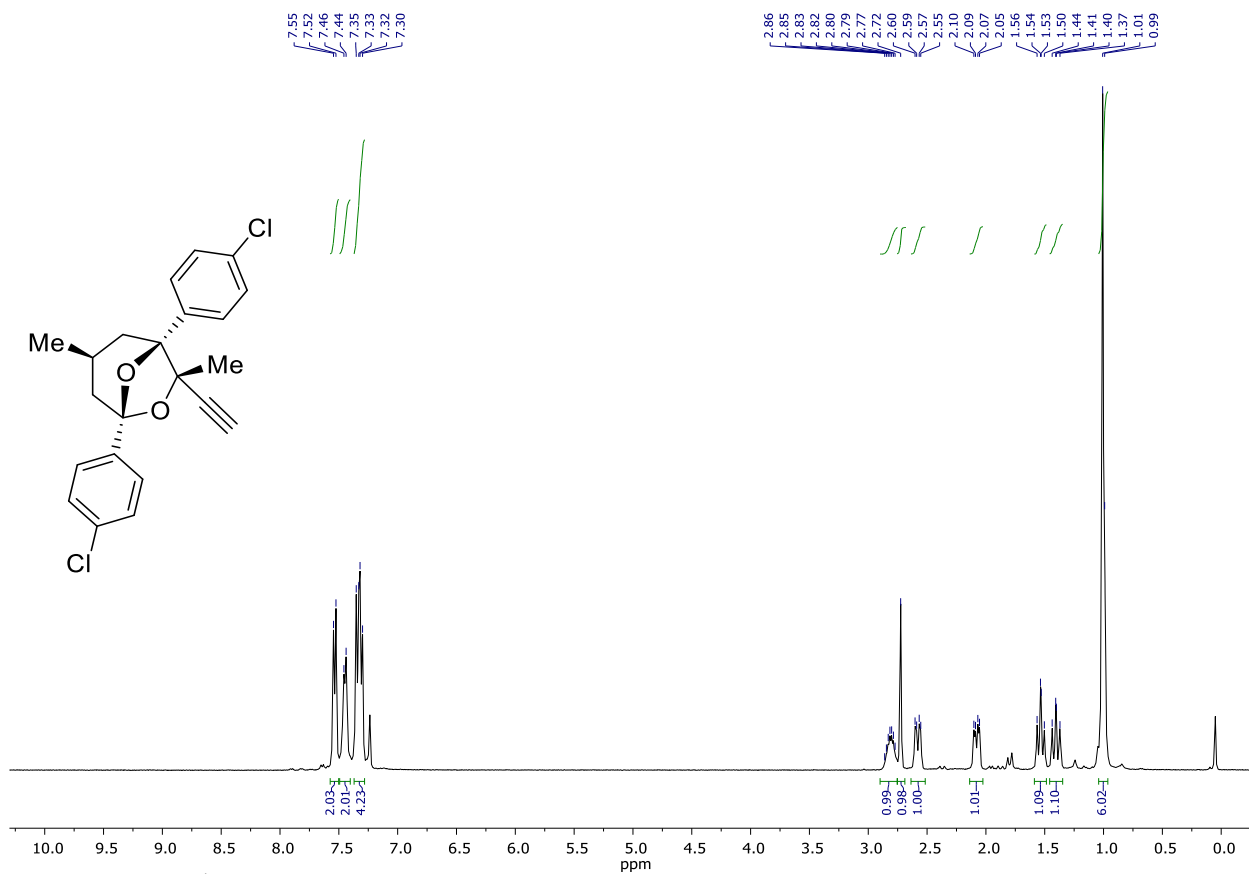


^1H NMR Spectrum of $(1S^*,3S^*,5R^*,7S^*)$ -**5ga** (400.1 MHz, CDCl_3)

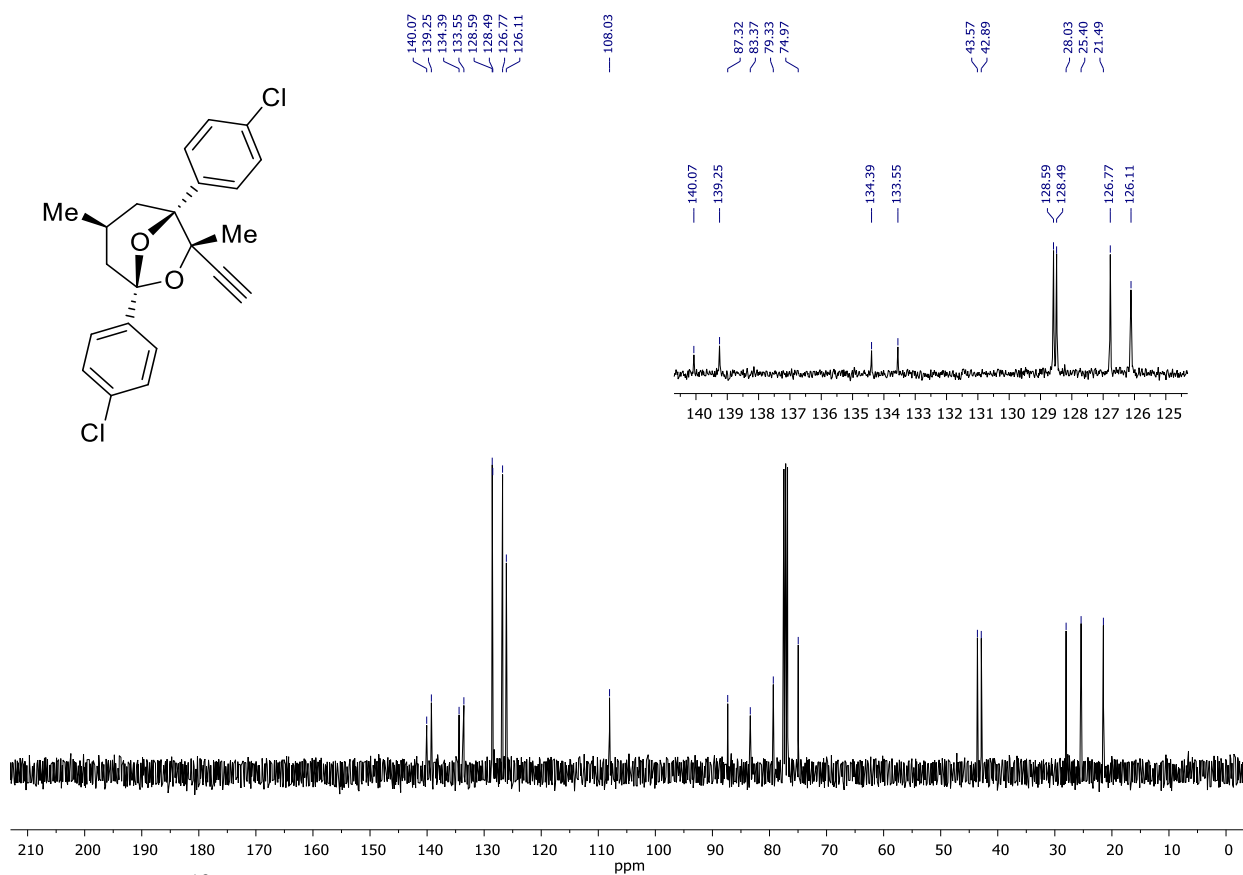


^{13}C NMR Spectrum of $(1S^*,3S^*,5R^*,7S^*)$ -**5ga** (100.6 MHz, CDCl_3)

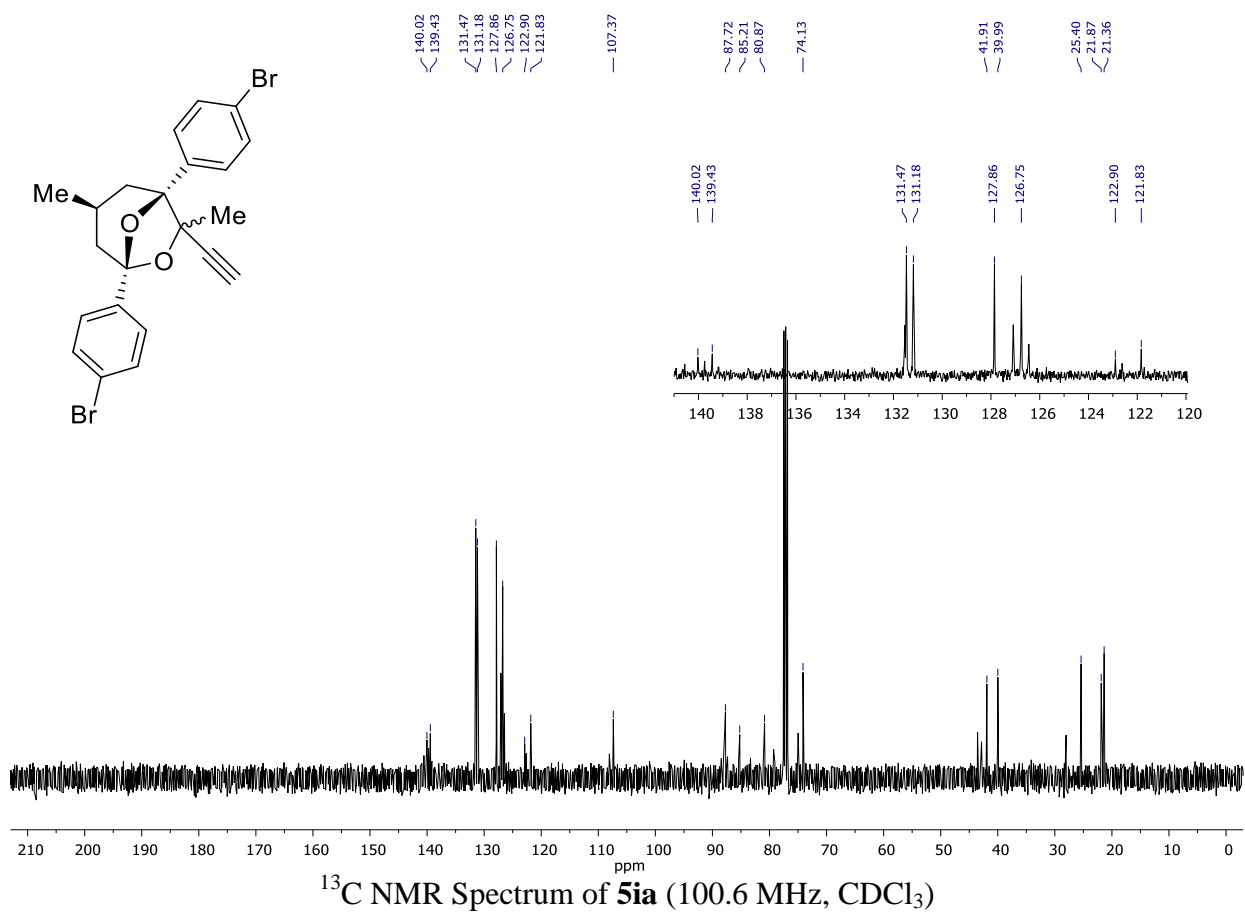
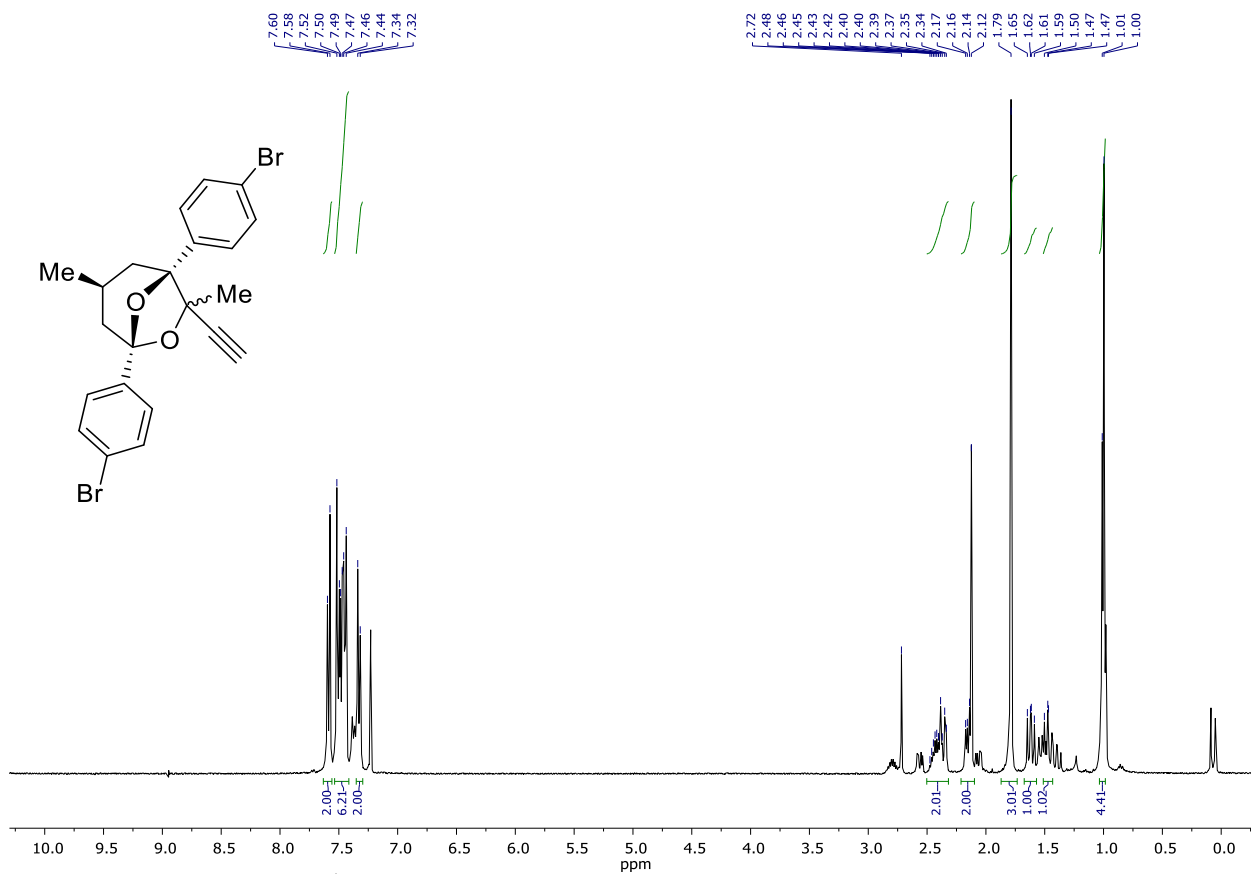


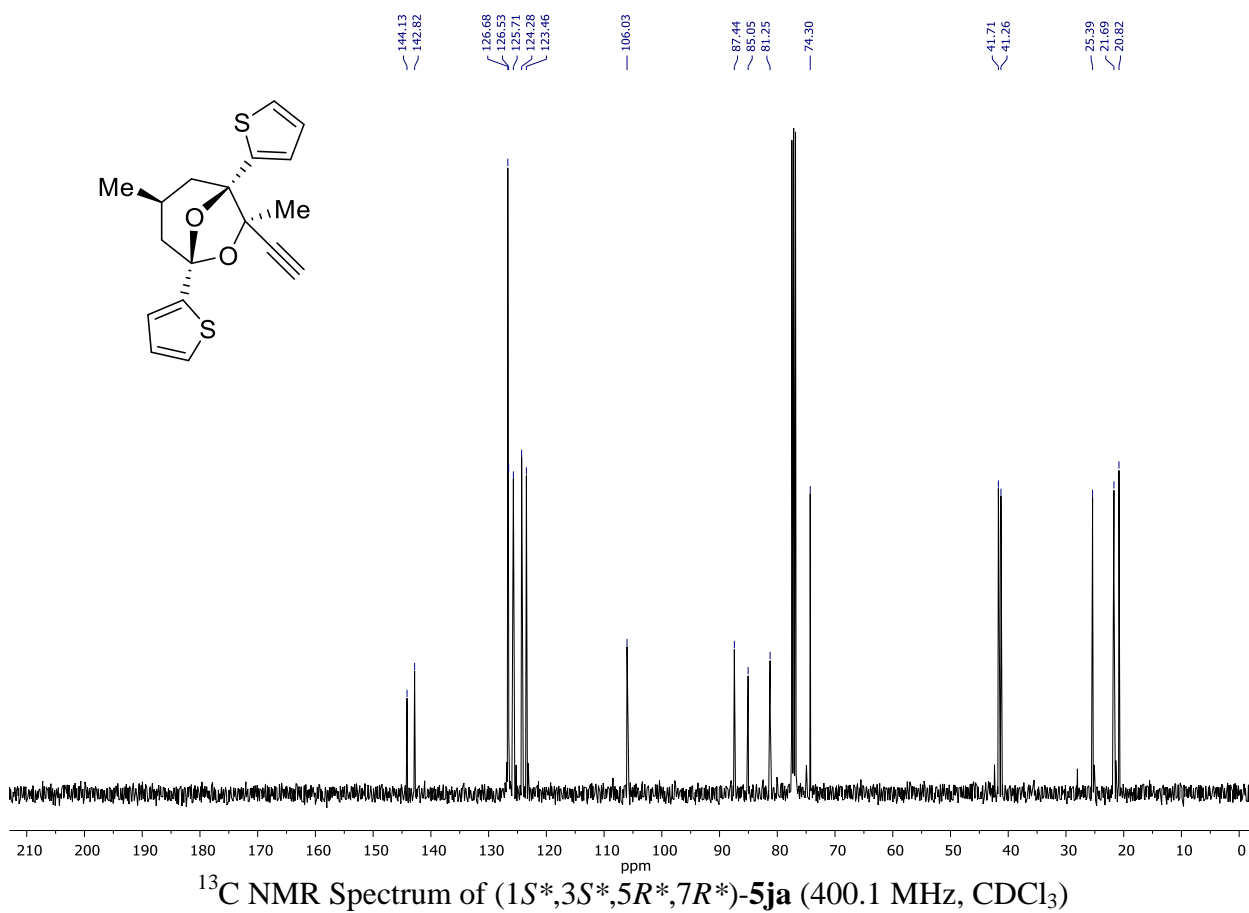
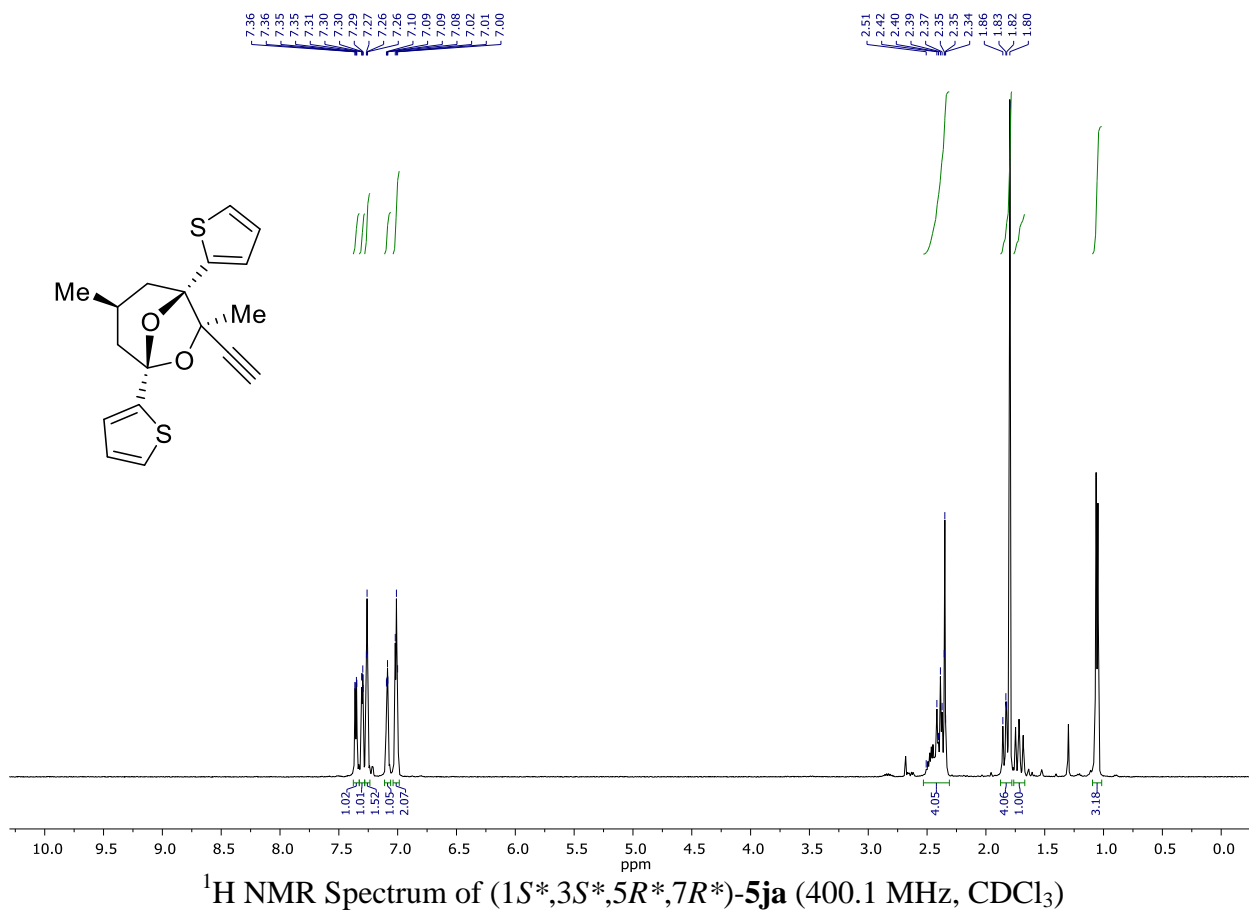


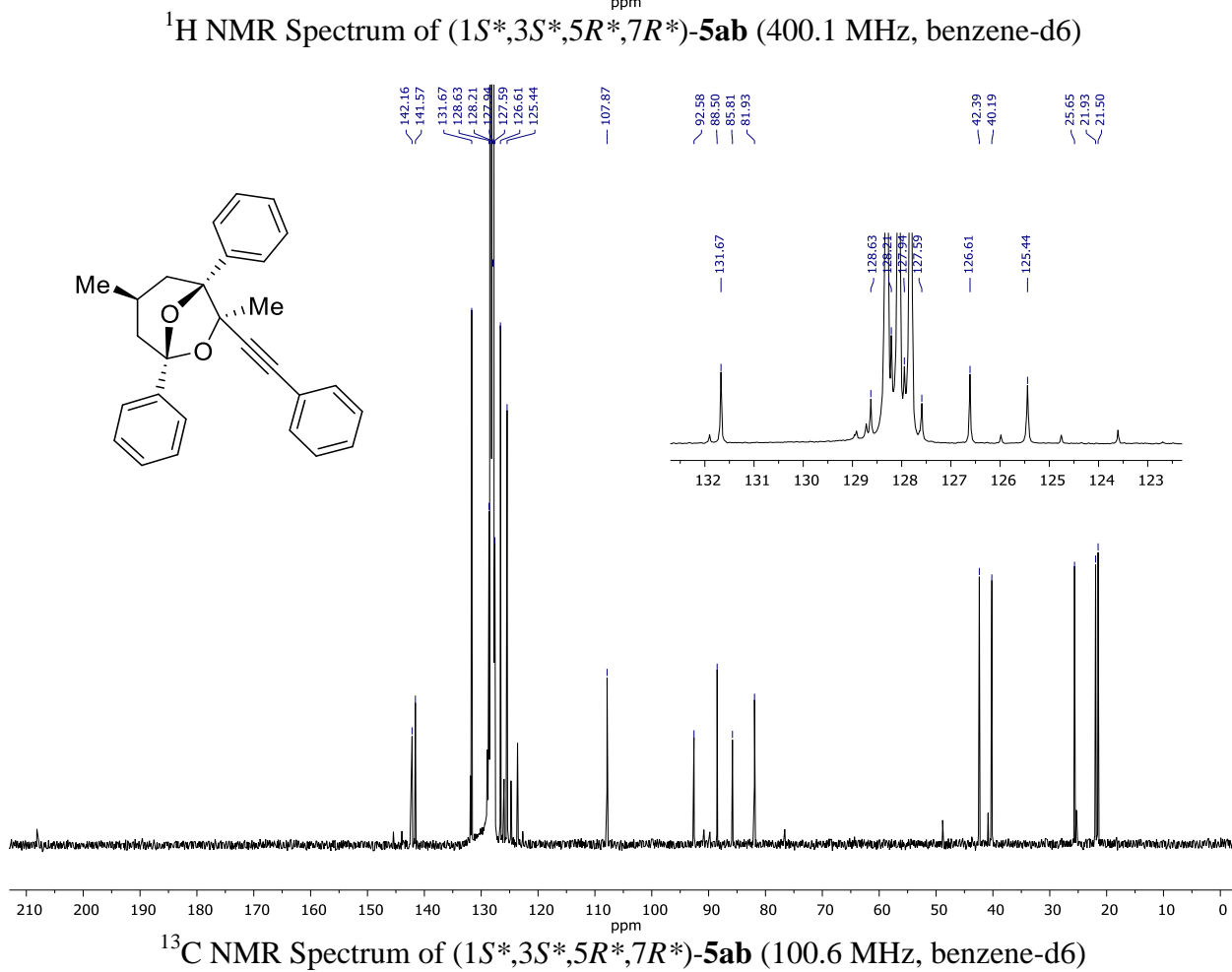
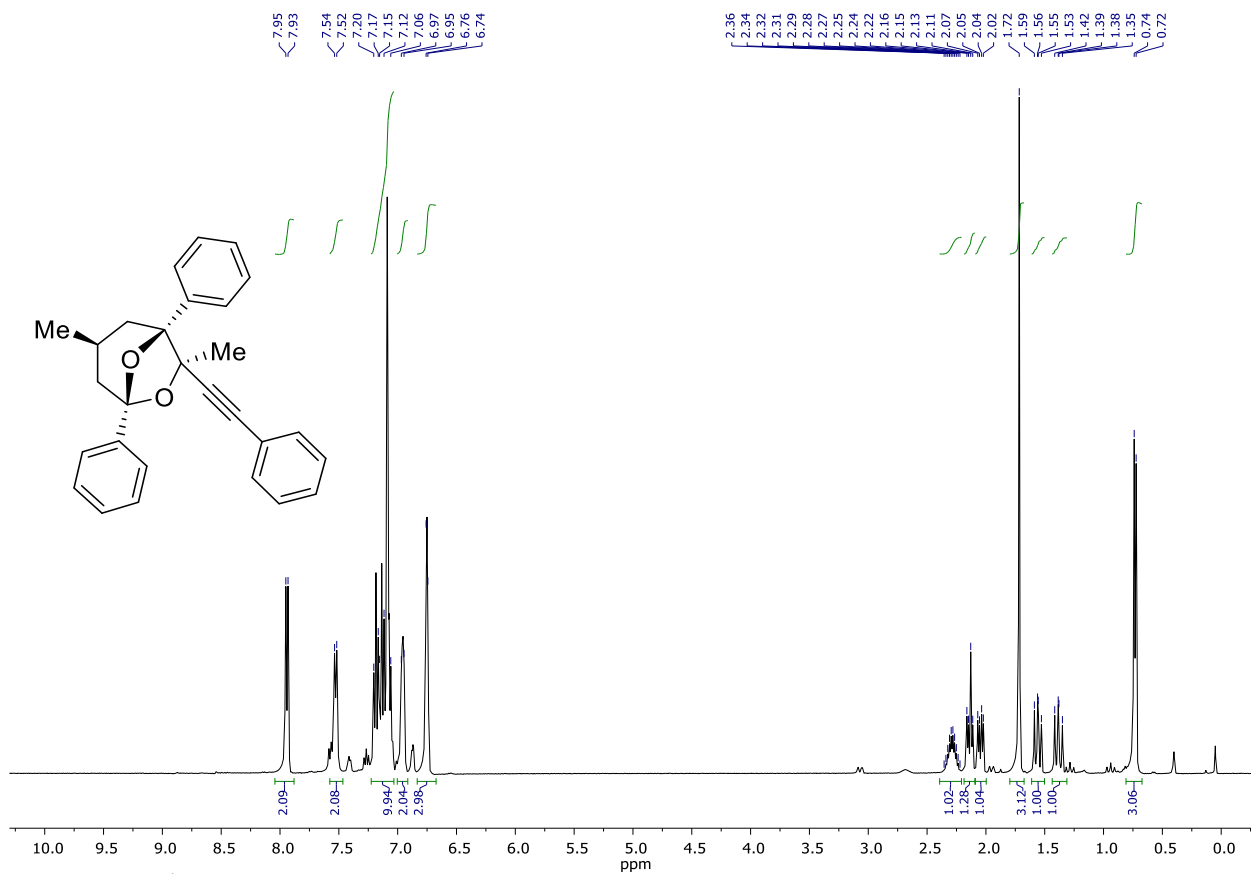
¹H NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5ha (400.1 MHz, CDCl₃)**

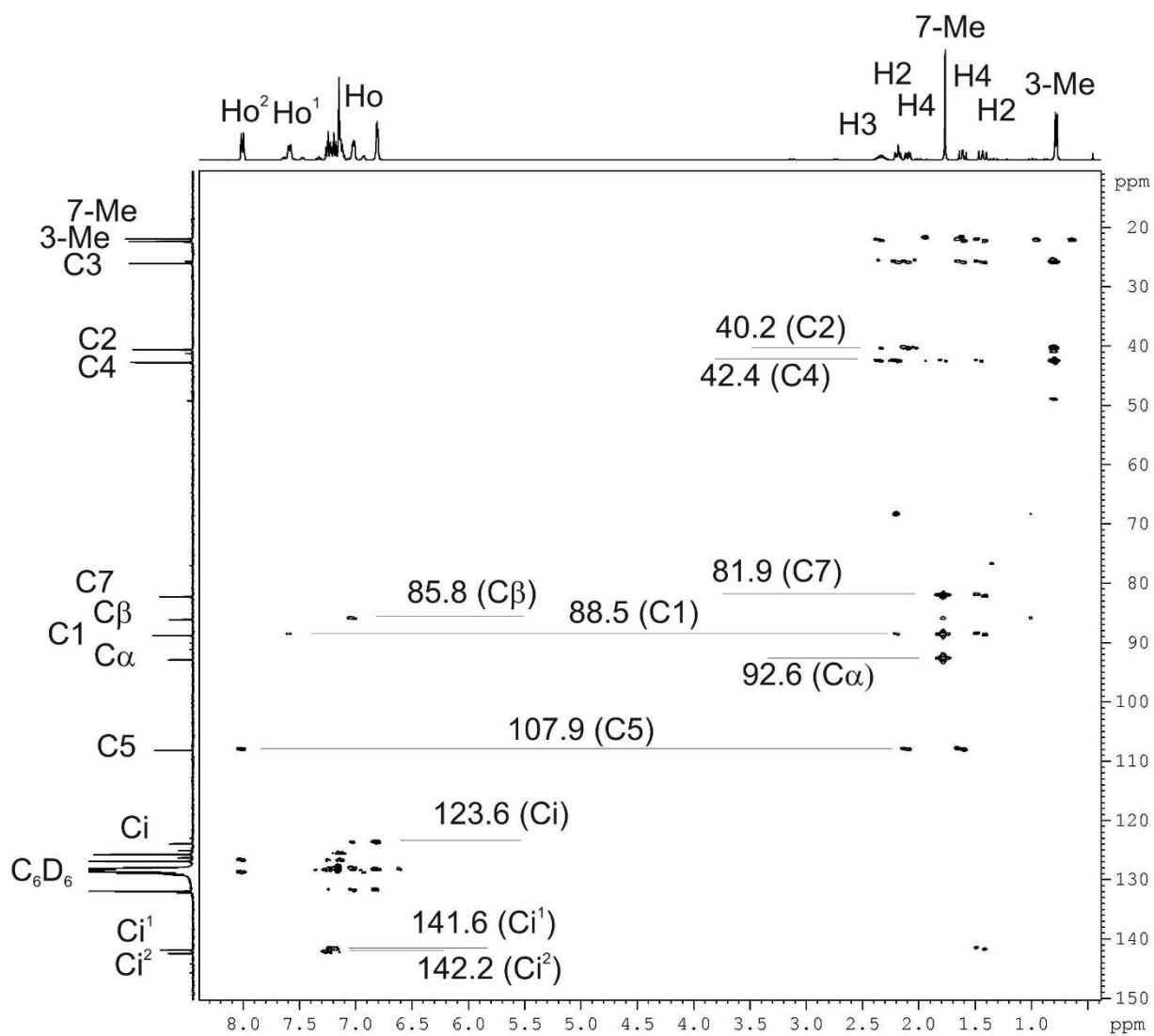


¹³C NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5ha (100.6 MHz, CDCl₃)**

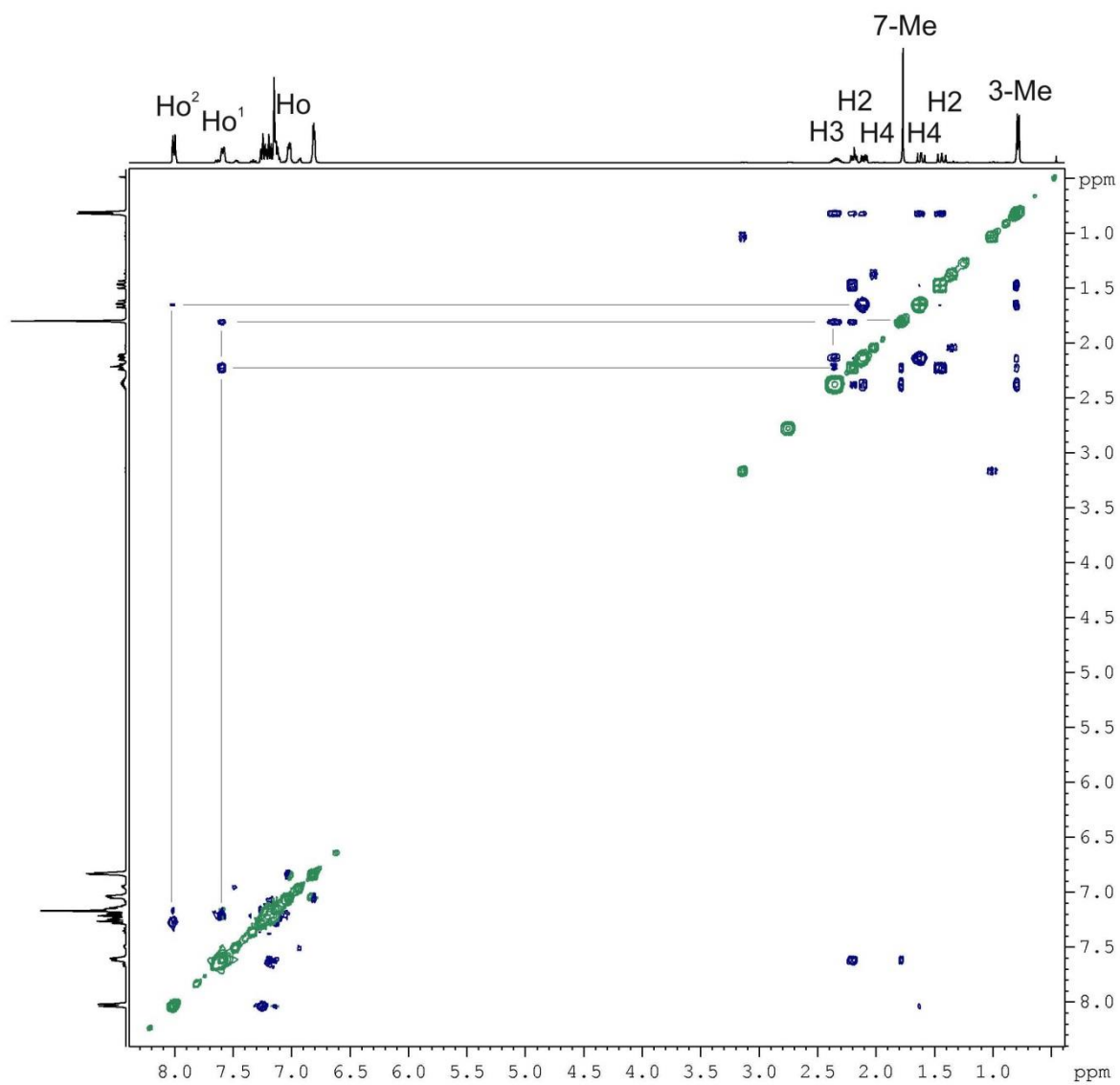




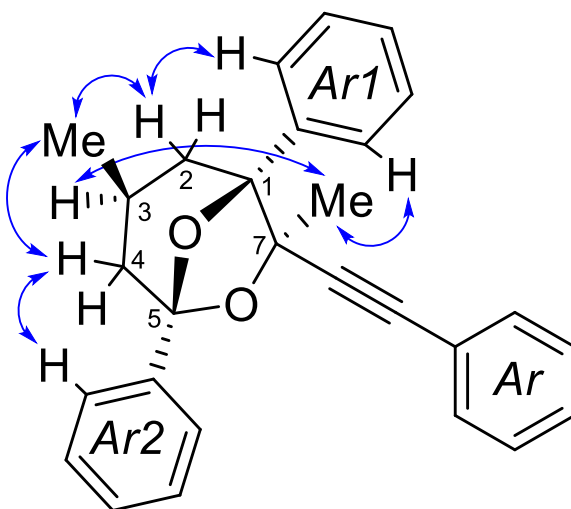


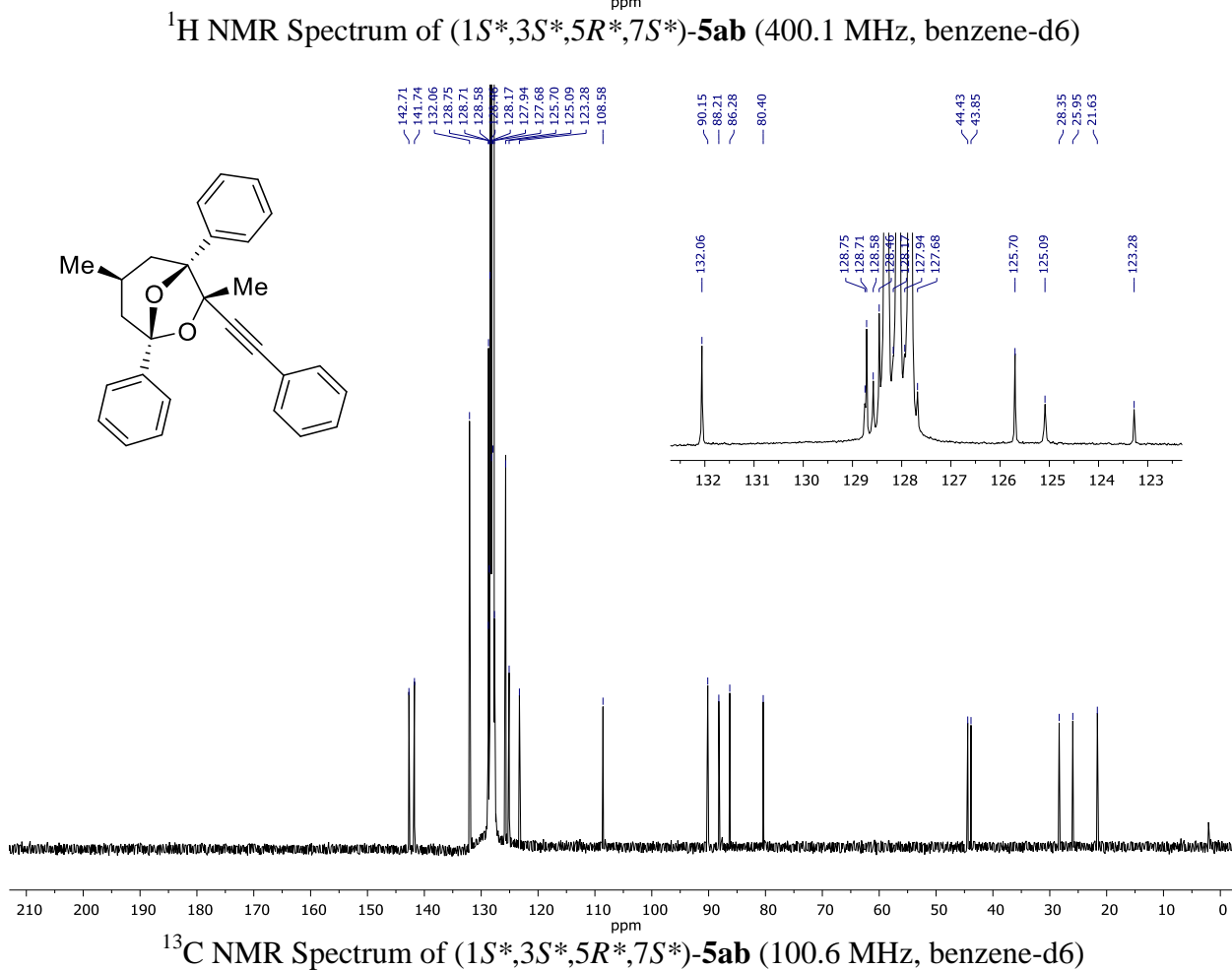
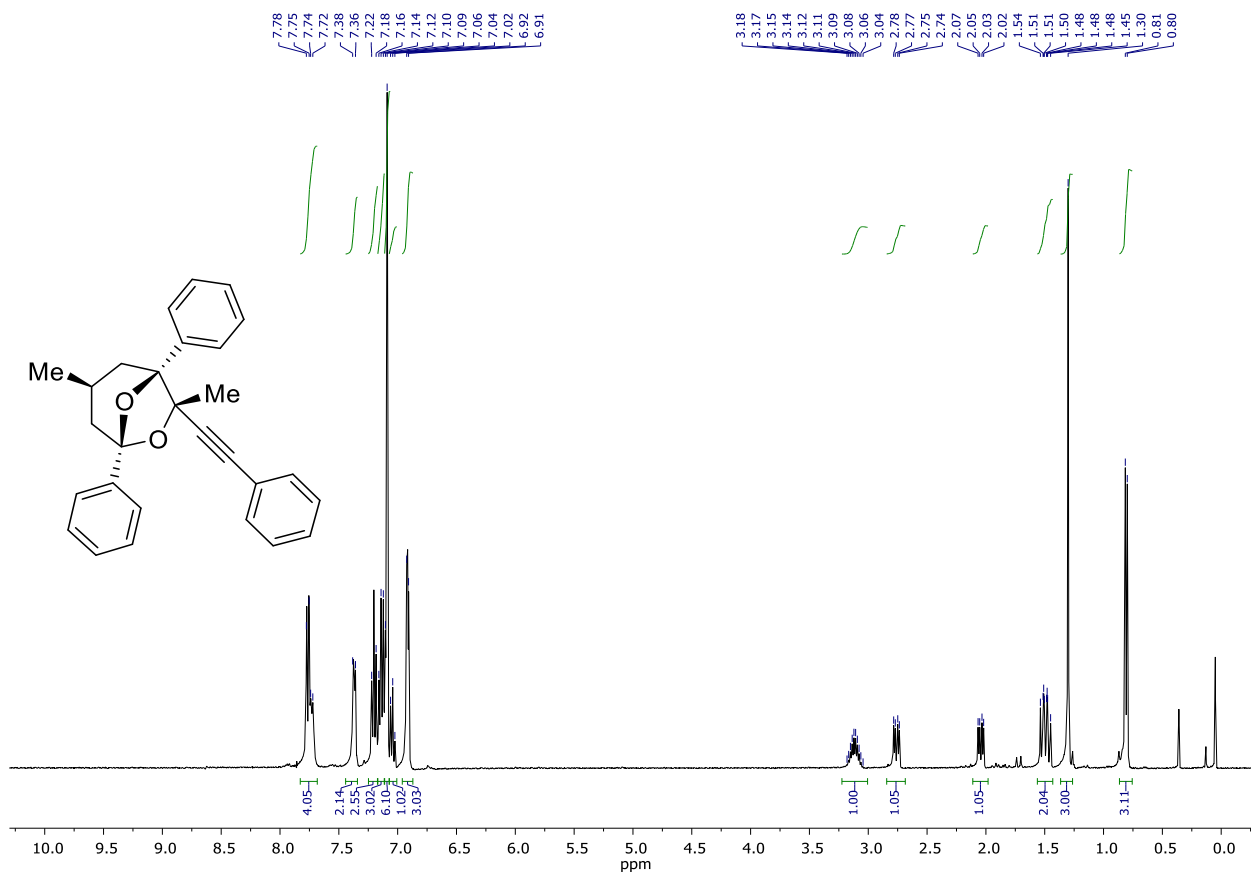


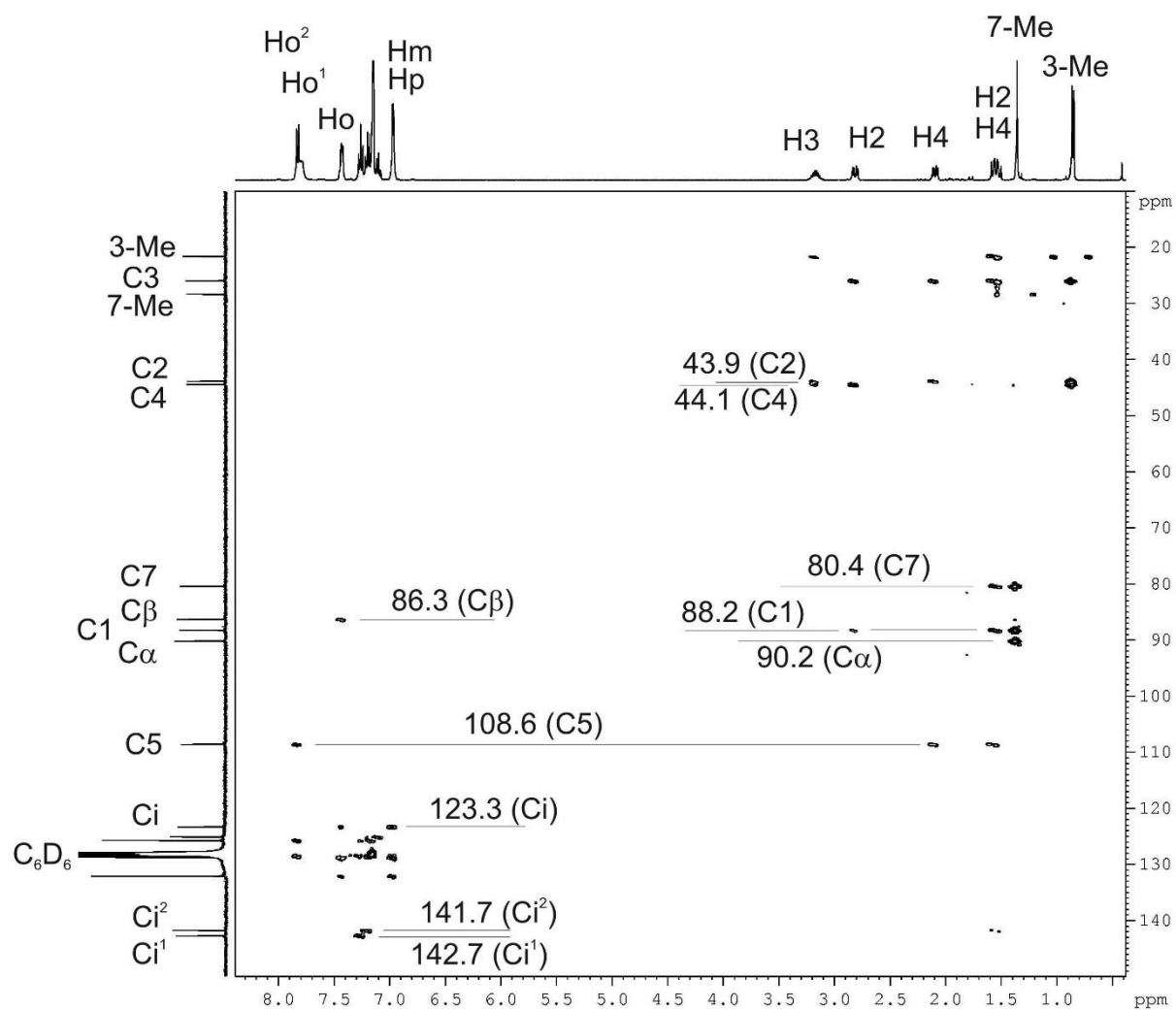
2D ^1H - ^{13}C HMBC Spectrum of (1*S**,3*S**,5*R**,7*R**)-5ab.



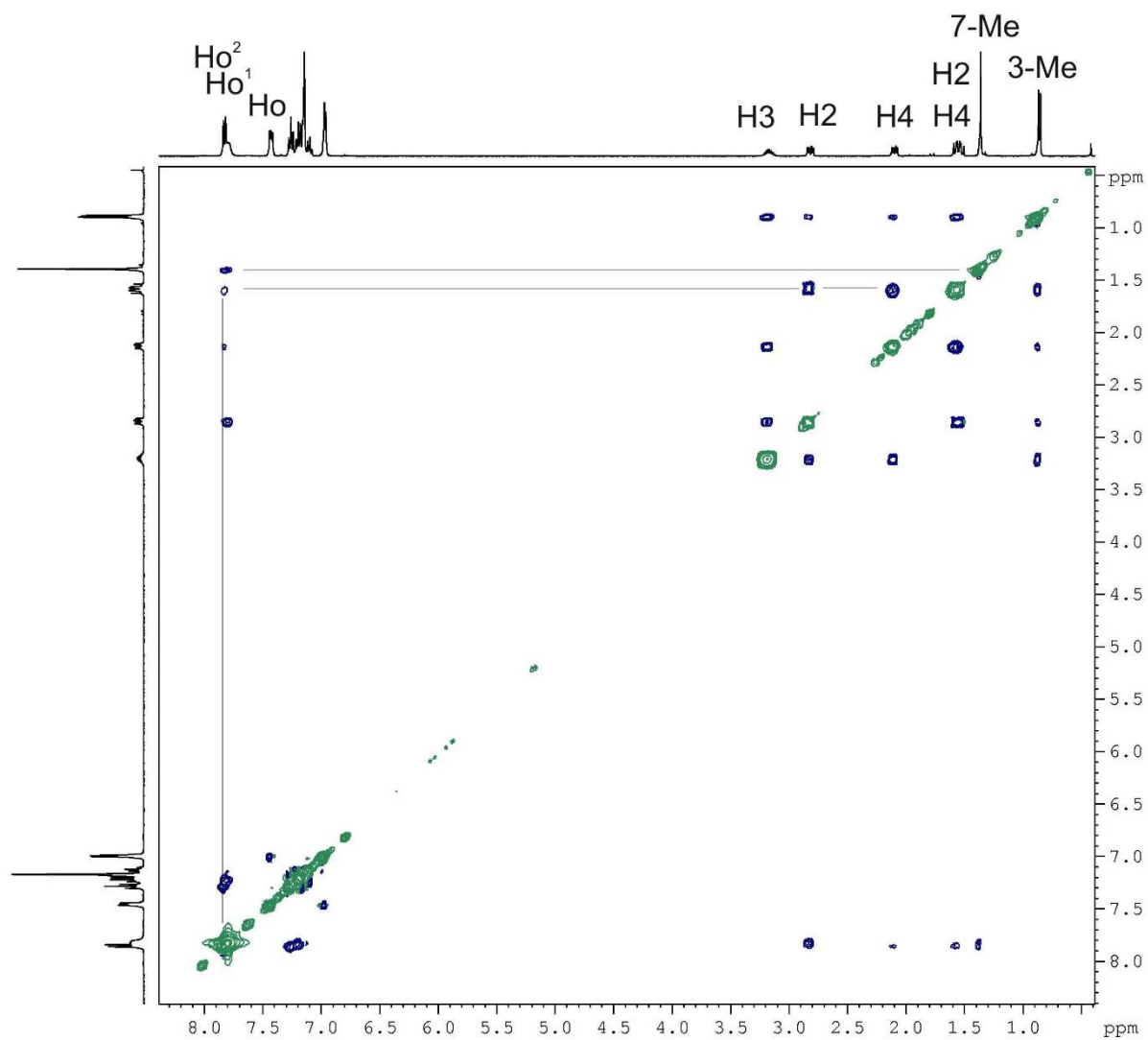
2D NOESY Spectrum of (1*S**,3*S**,5*R**,7*R**)-**5ab** (400.1 MHz, benzene-*d*₆)



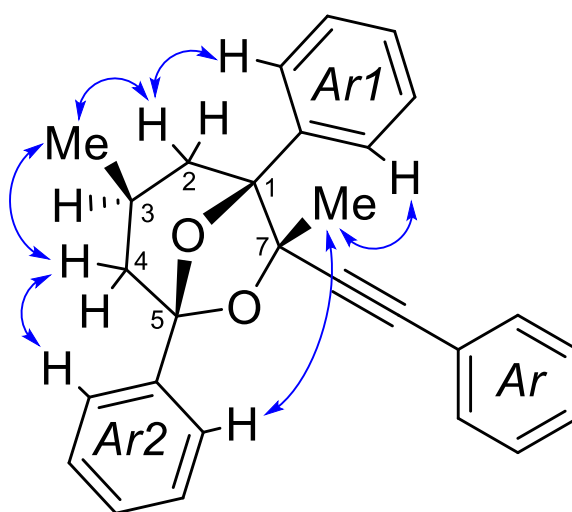


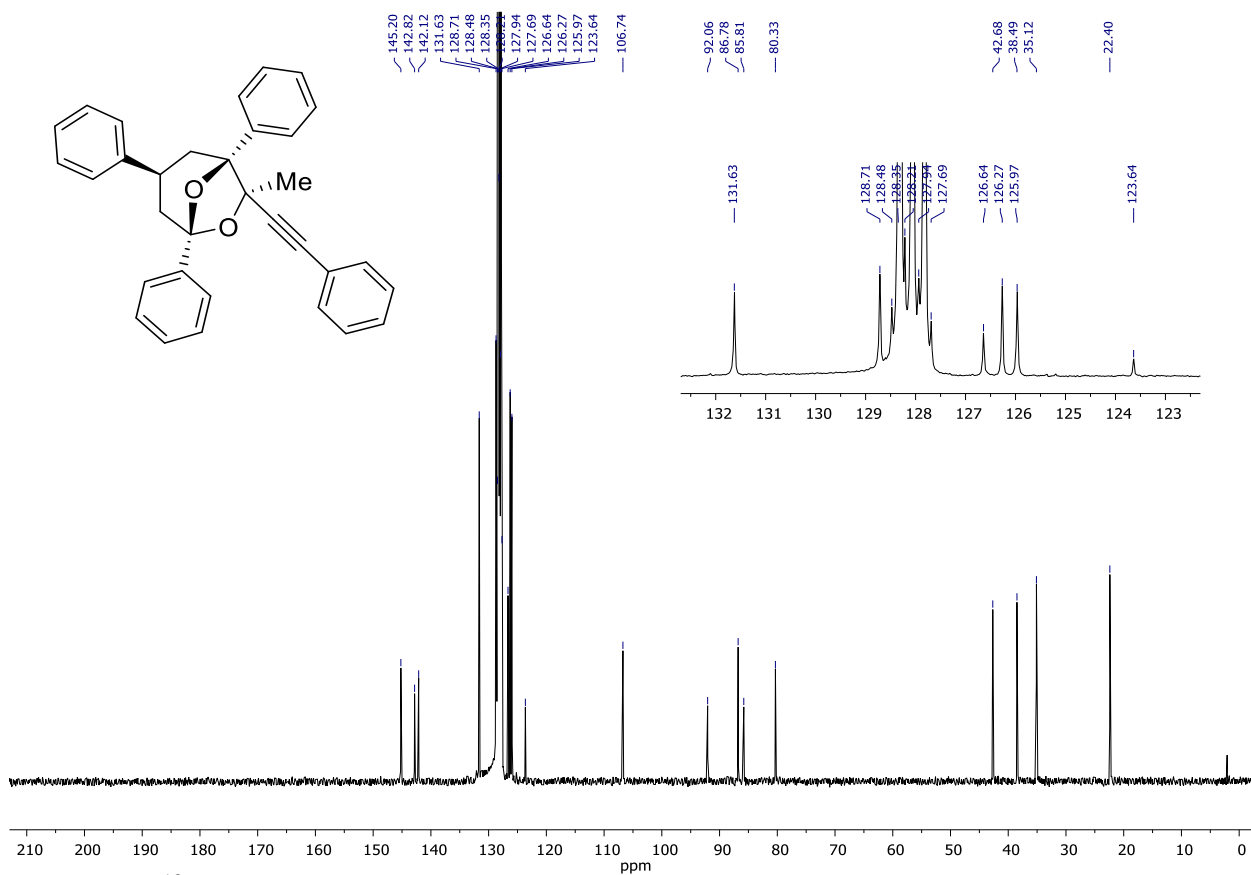
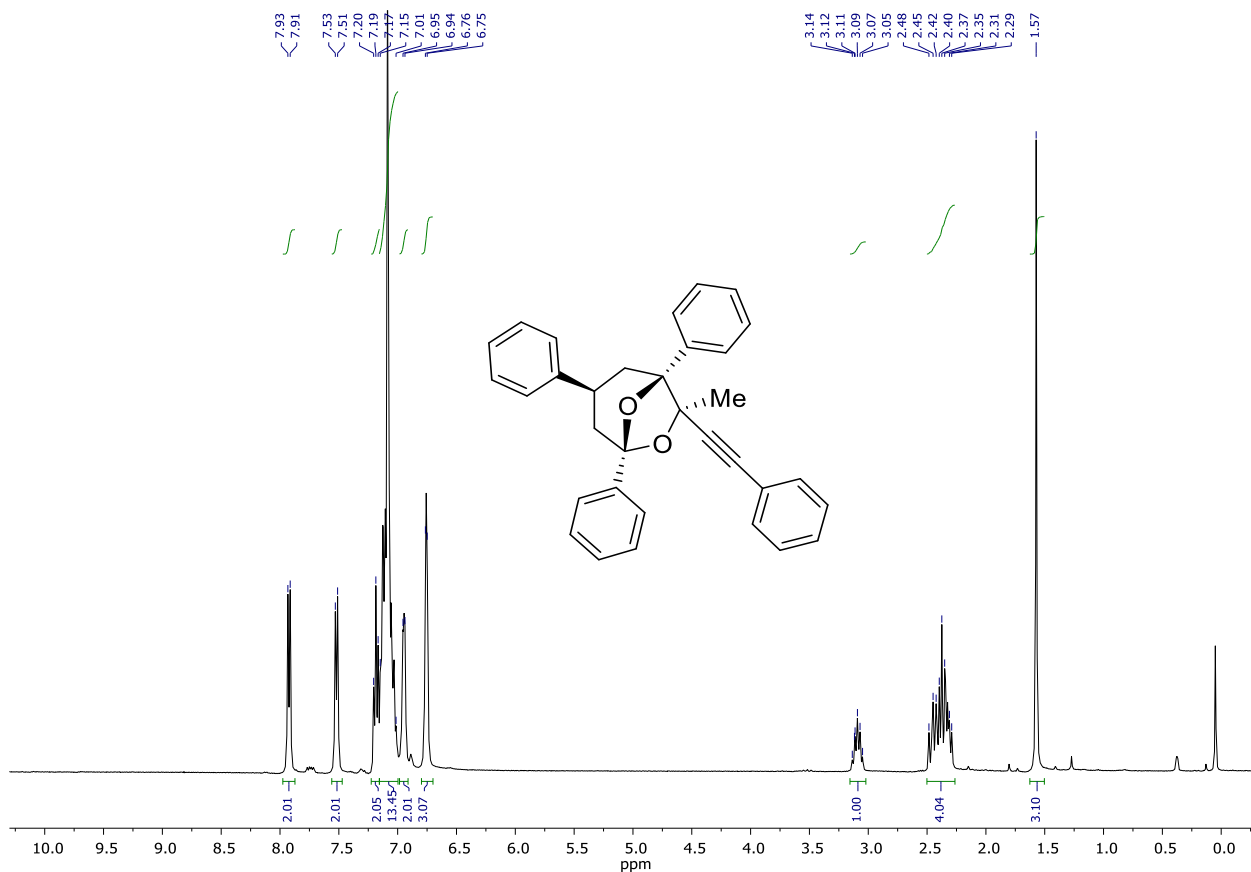


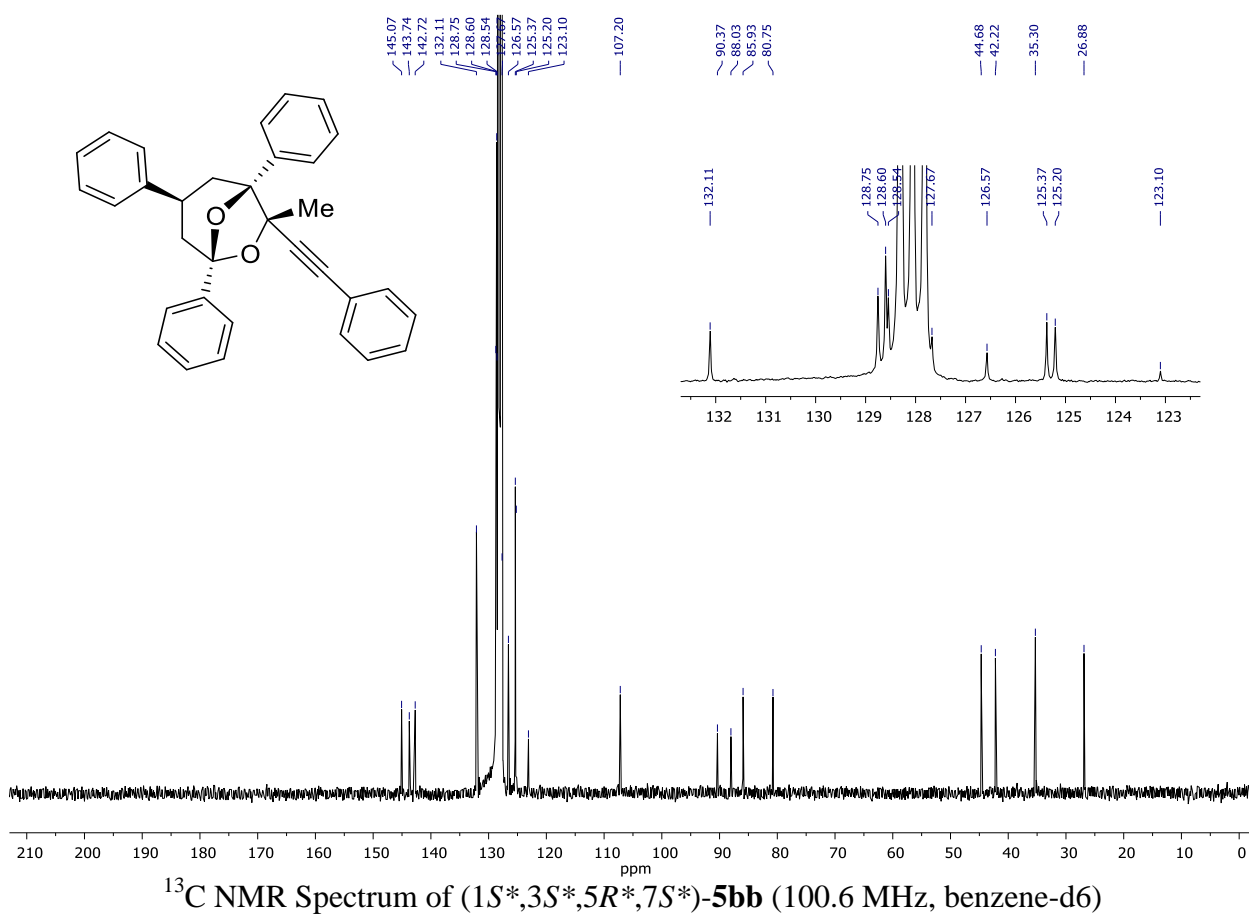
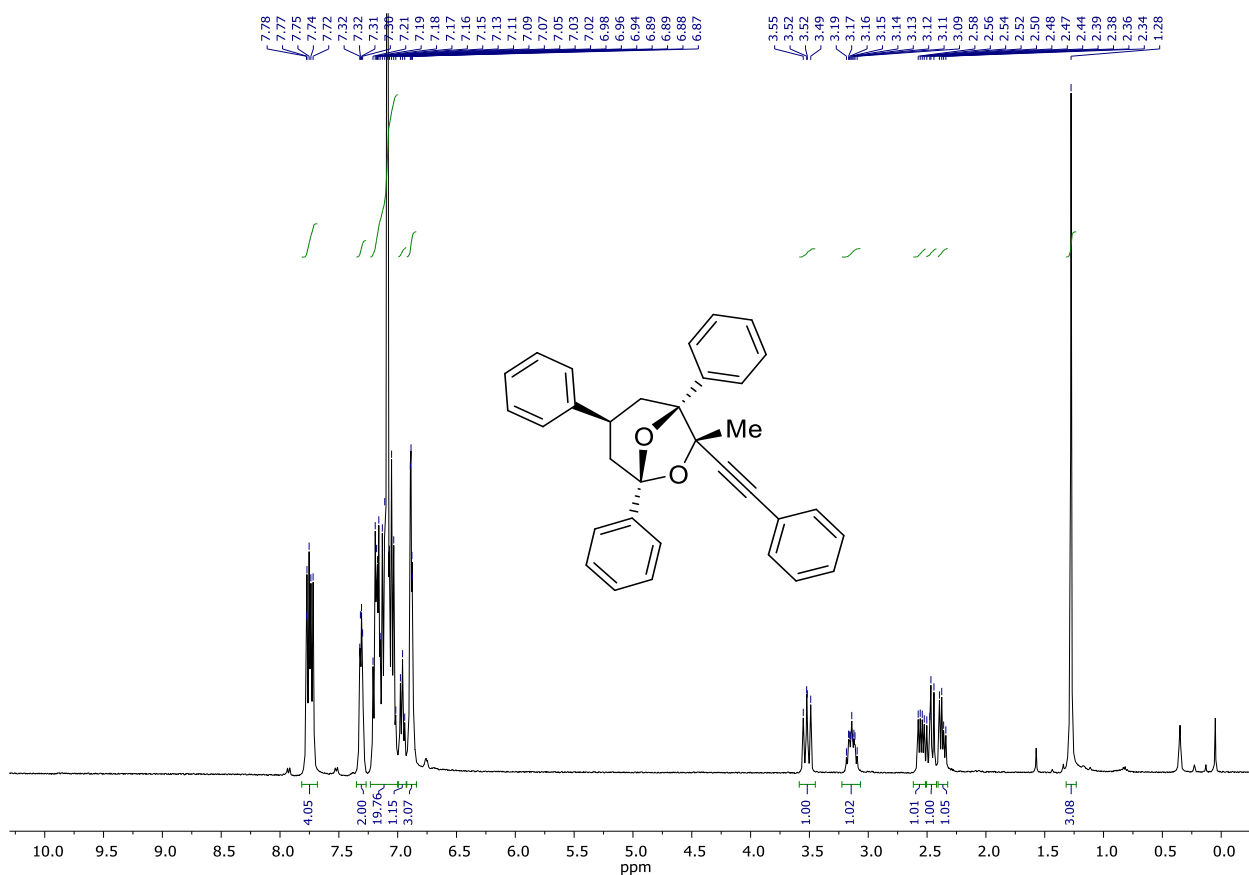
2D ^1H - ^{13}C HMBC Spectrum of (1*S**,3*S**,5*R**,7*S**)-5ab.

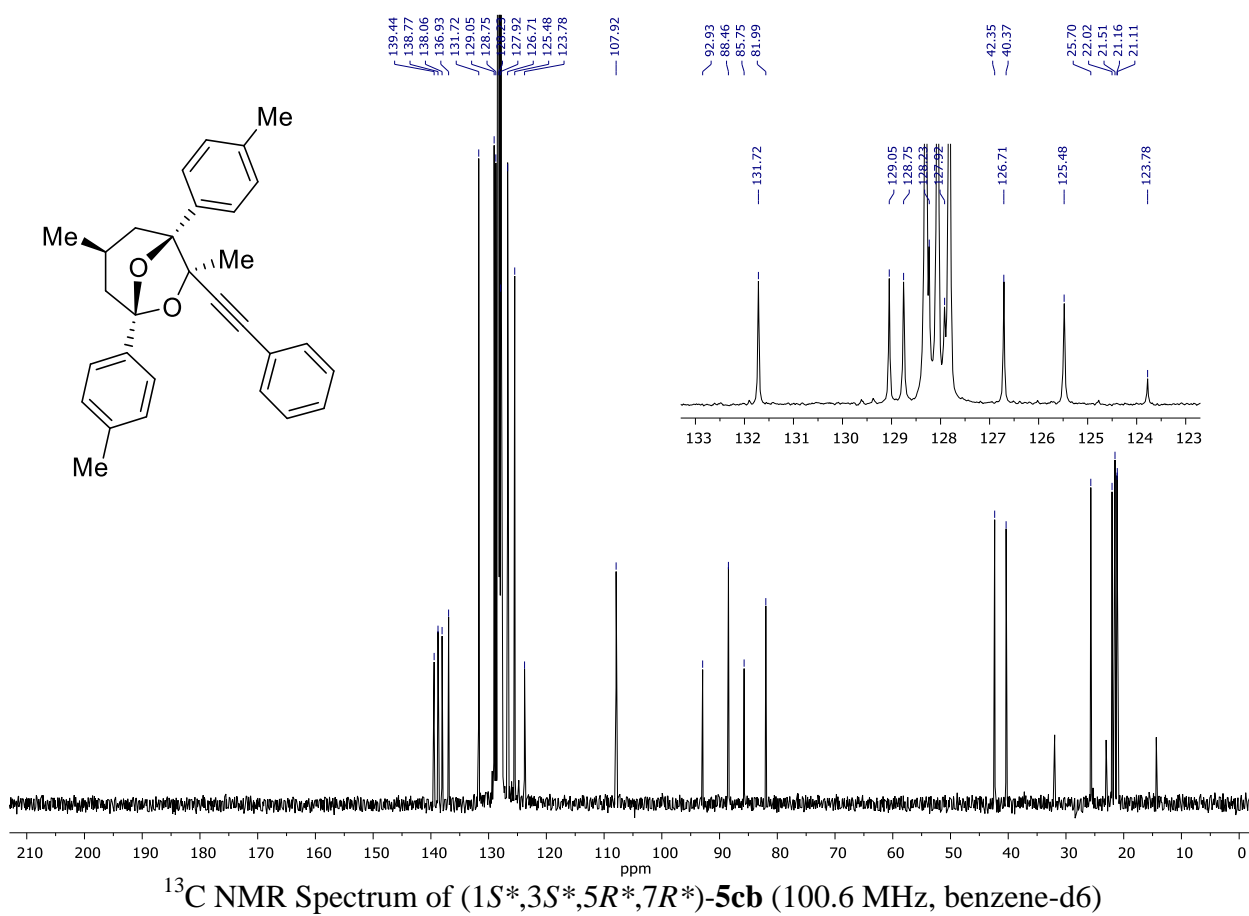
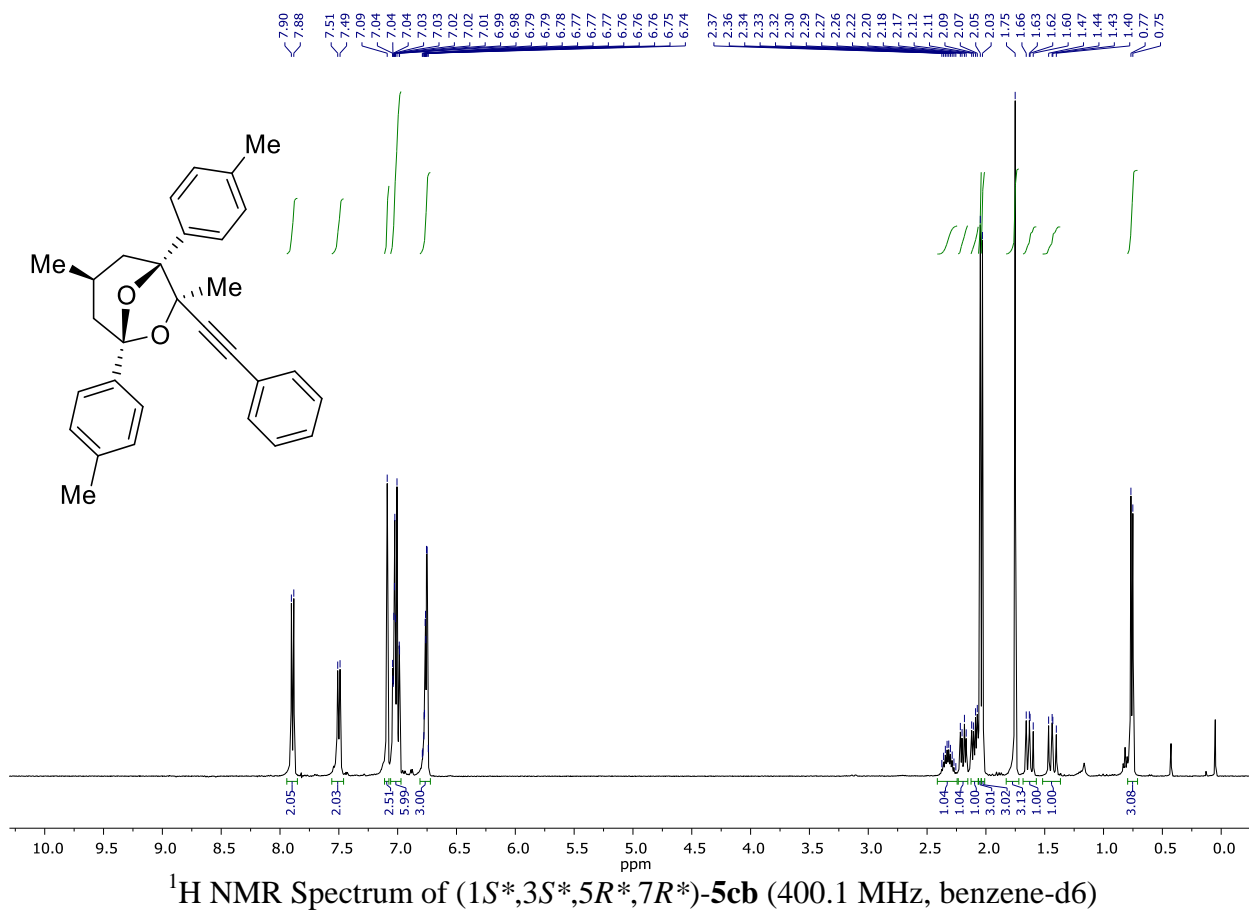


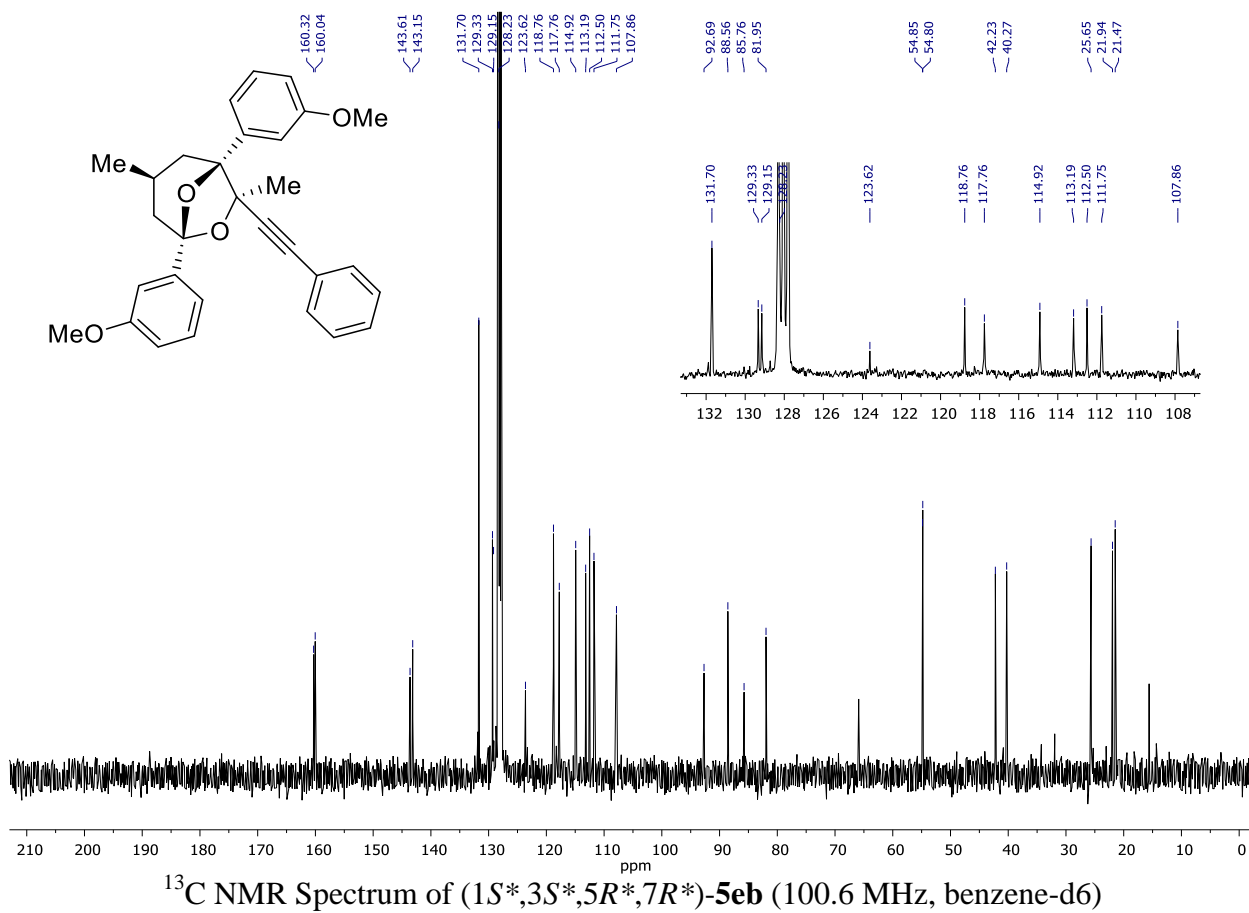
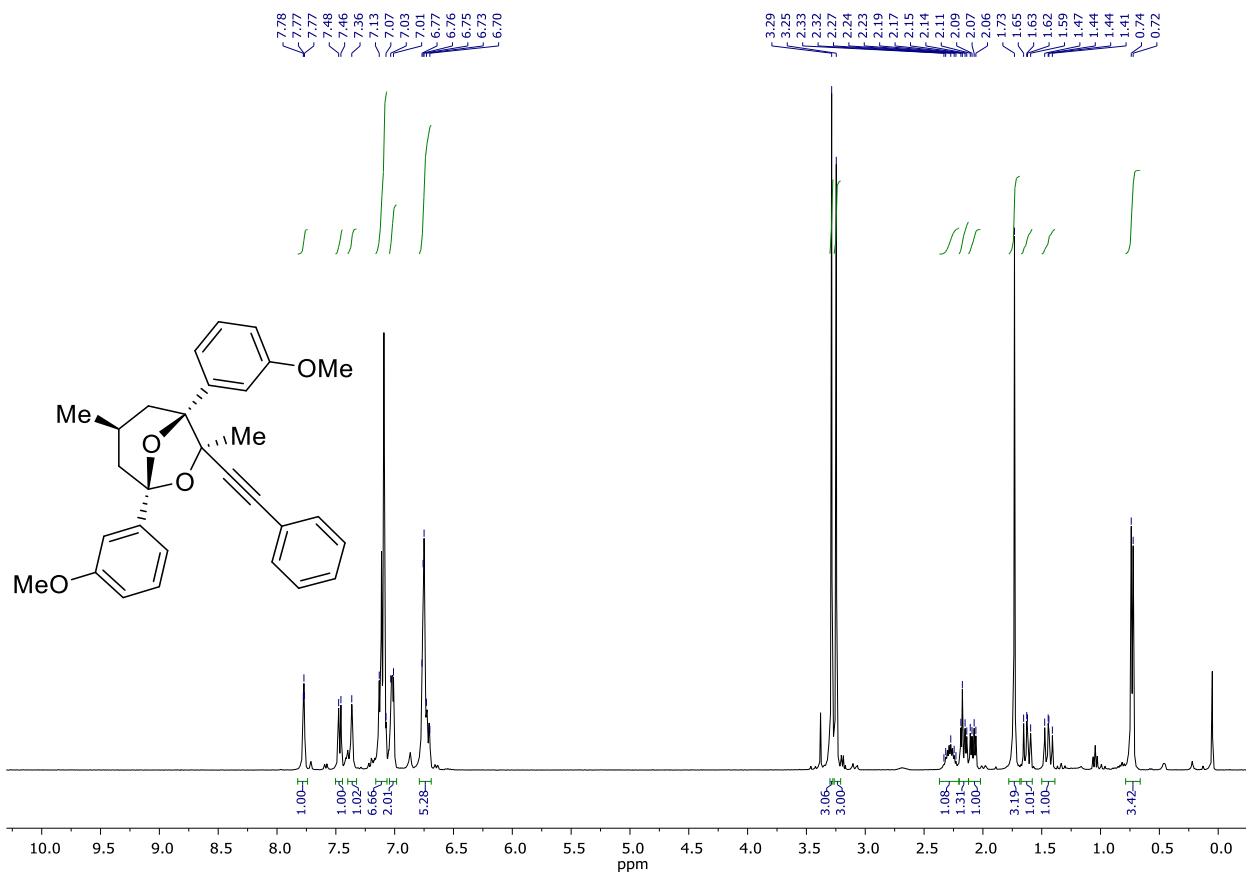
2D NOESY Spectrum of (1*S**,3*S**,5*R**,7*S**)-**5ab** (400.1 MHz, benzene-d₆)

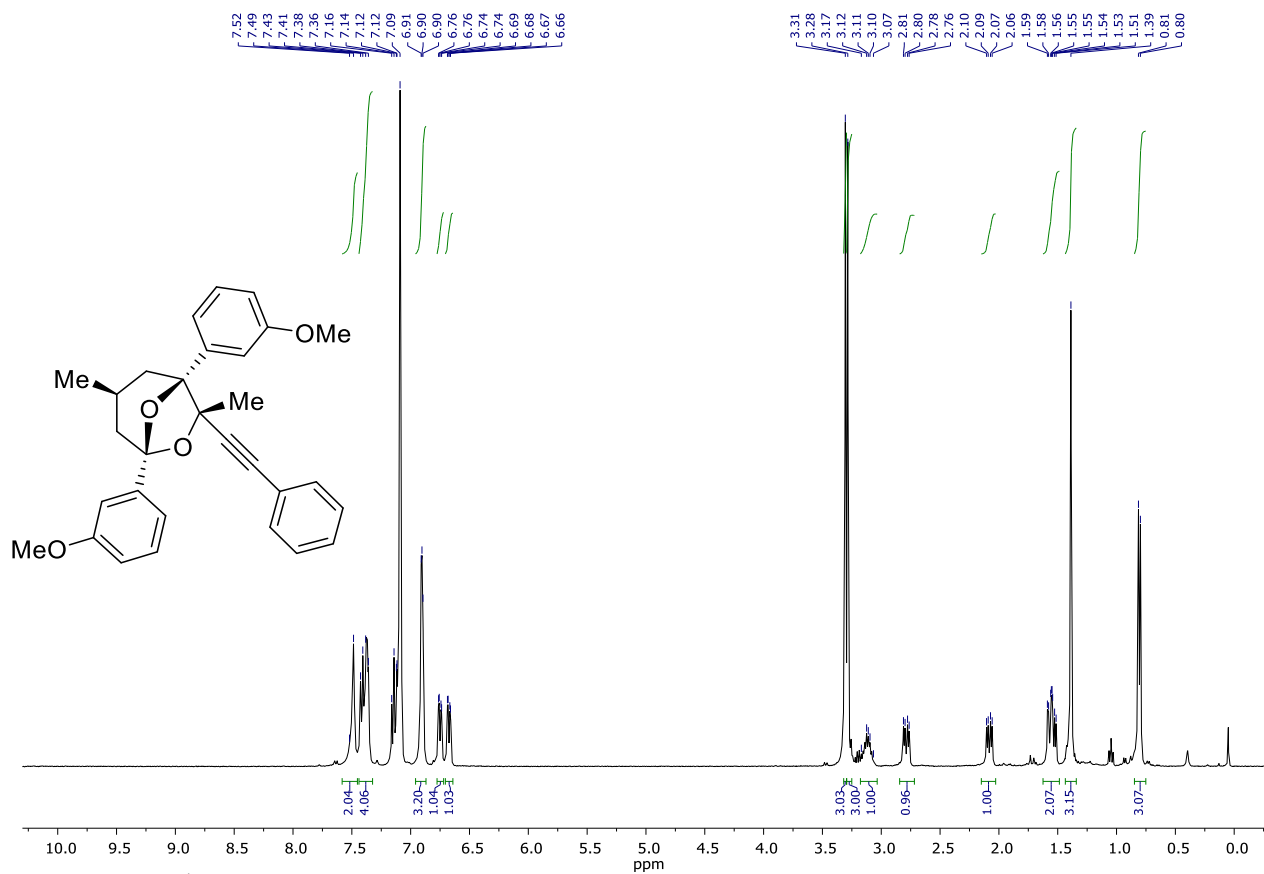




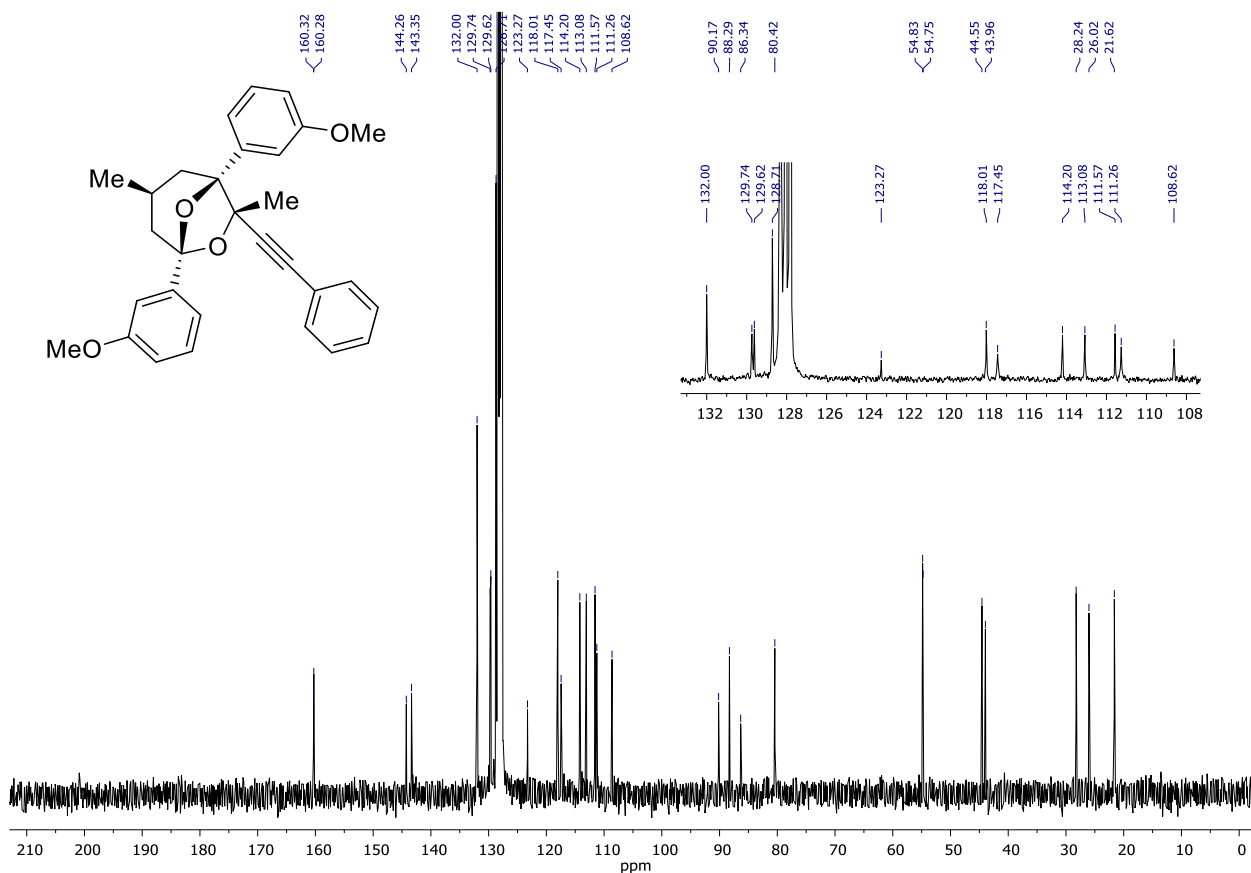




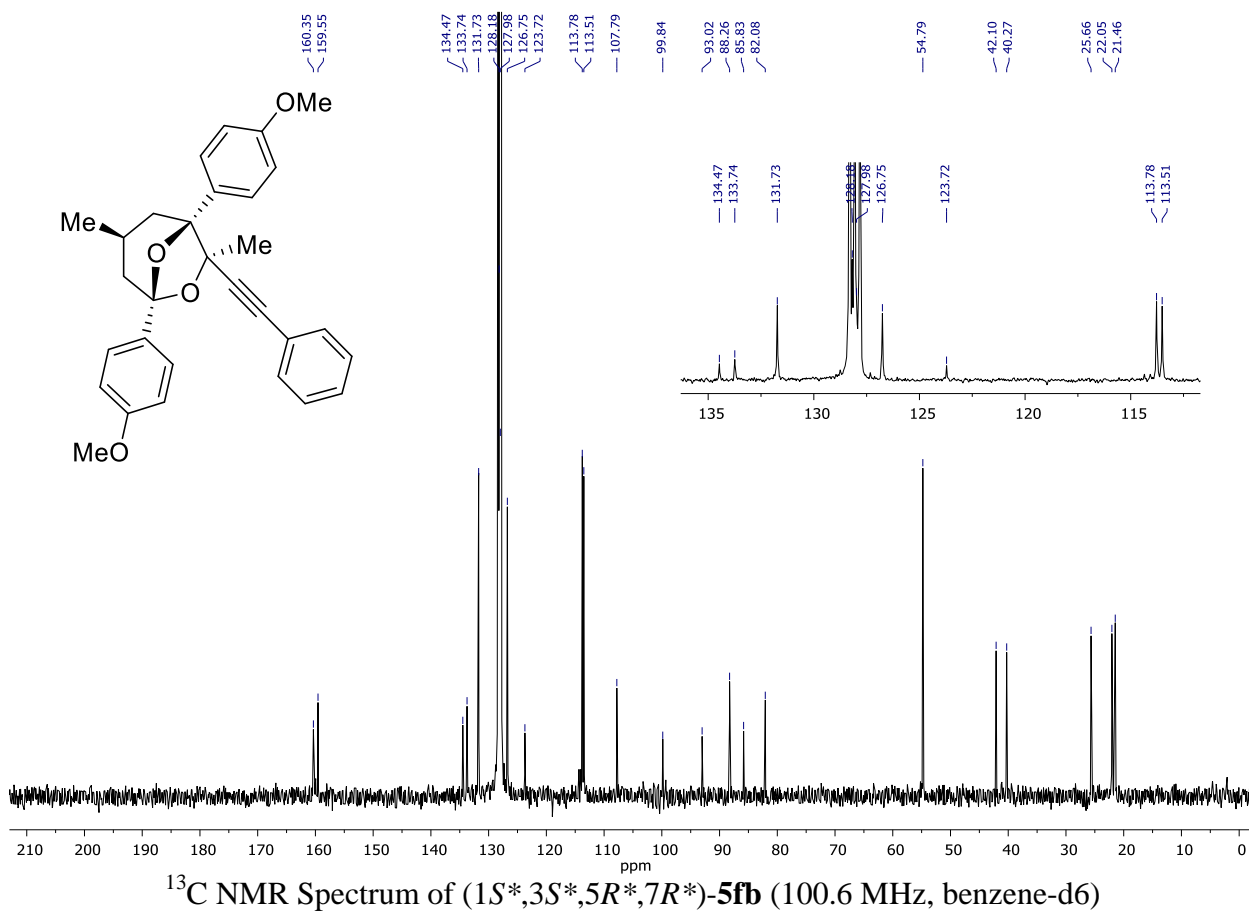
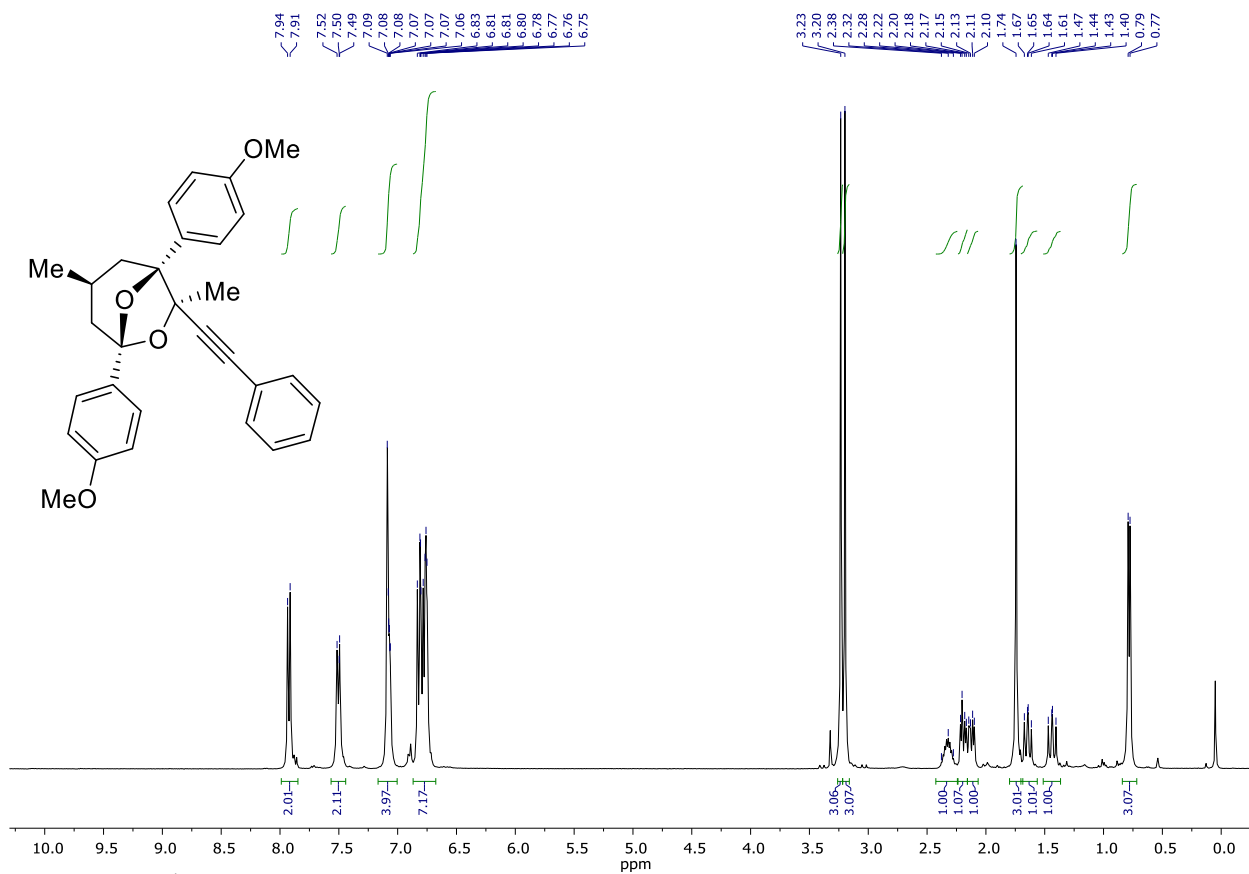


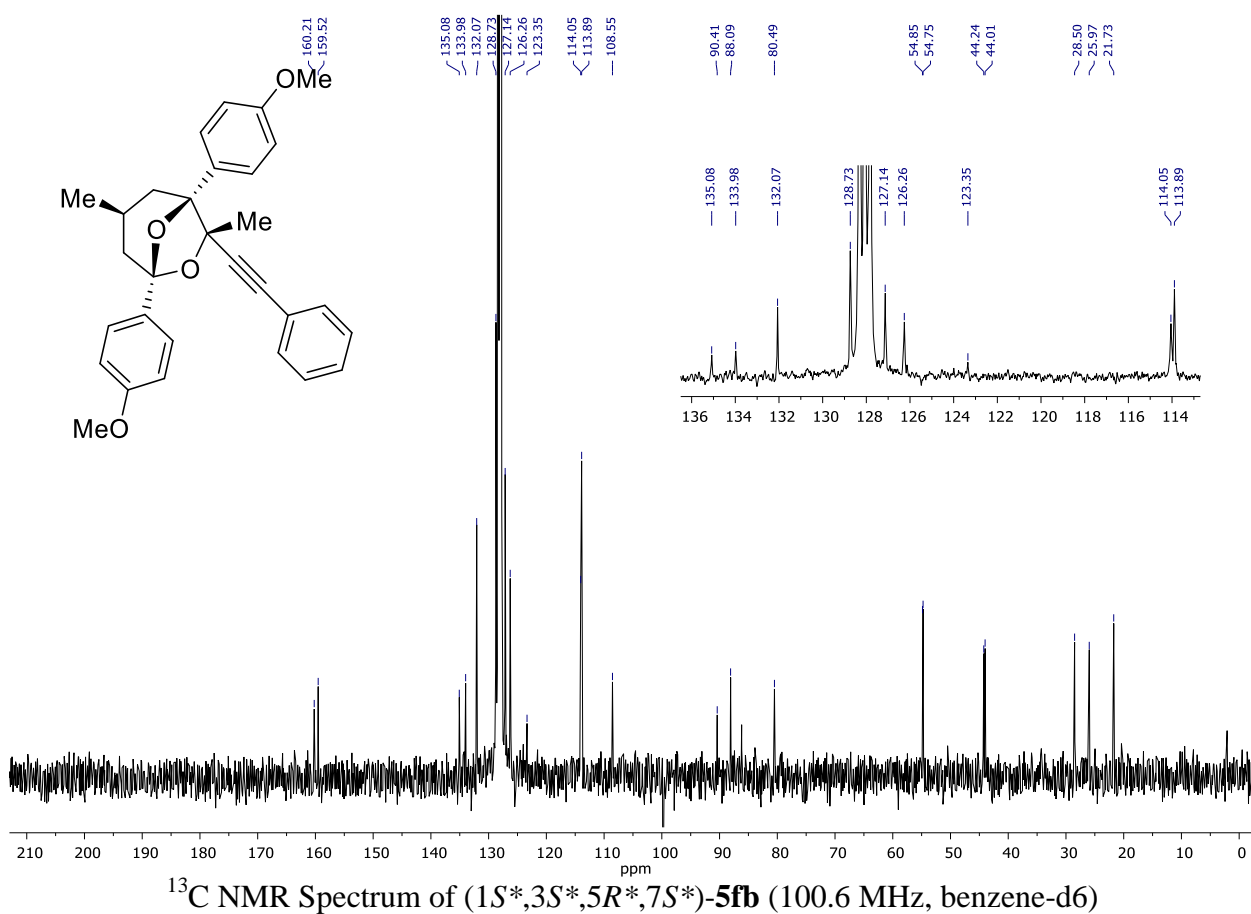
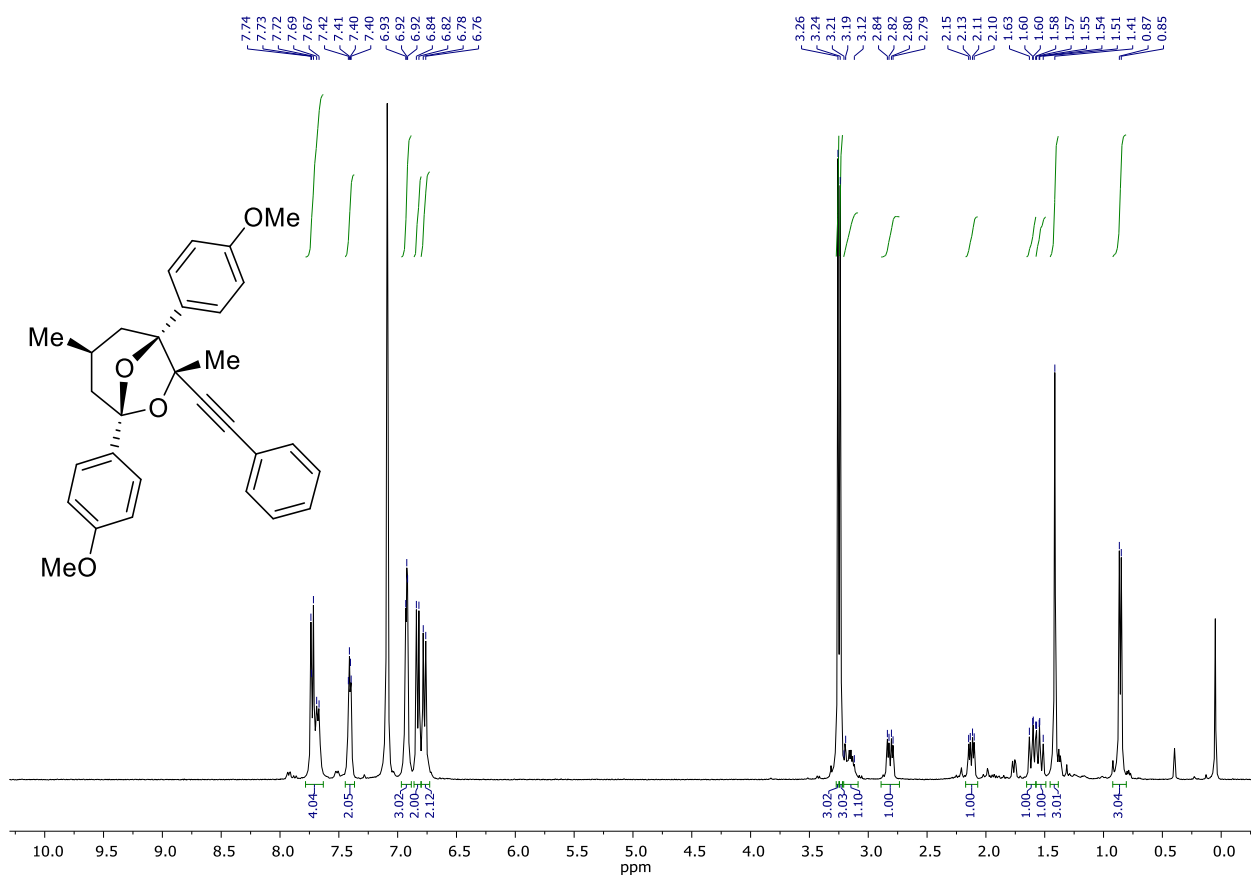


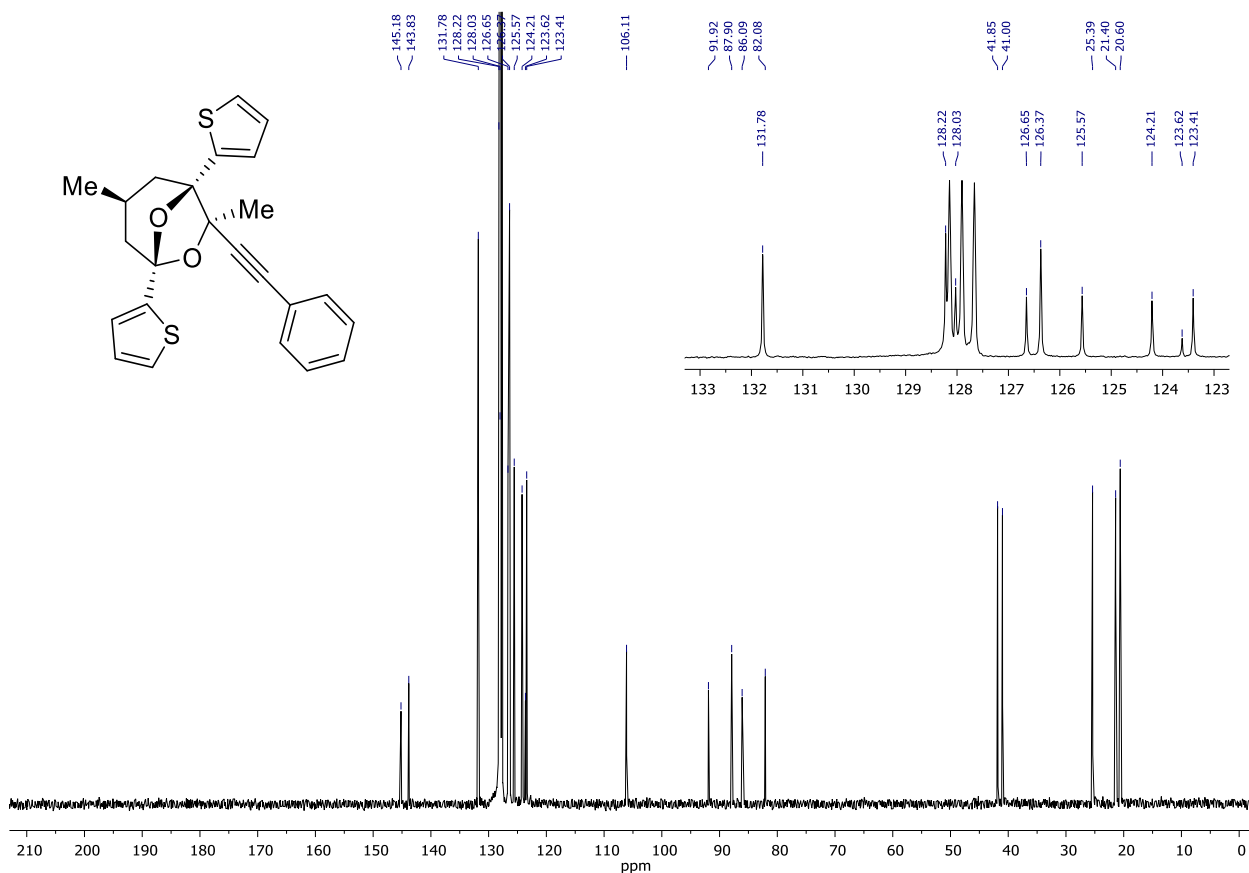
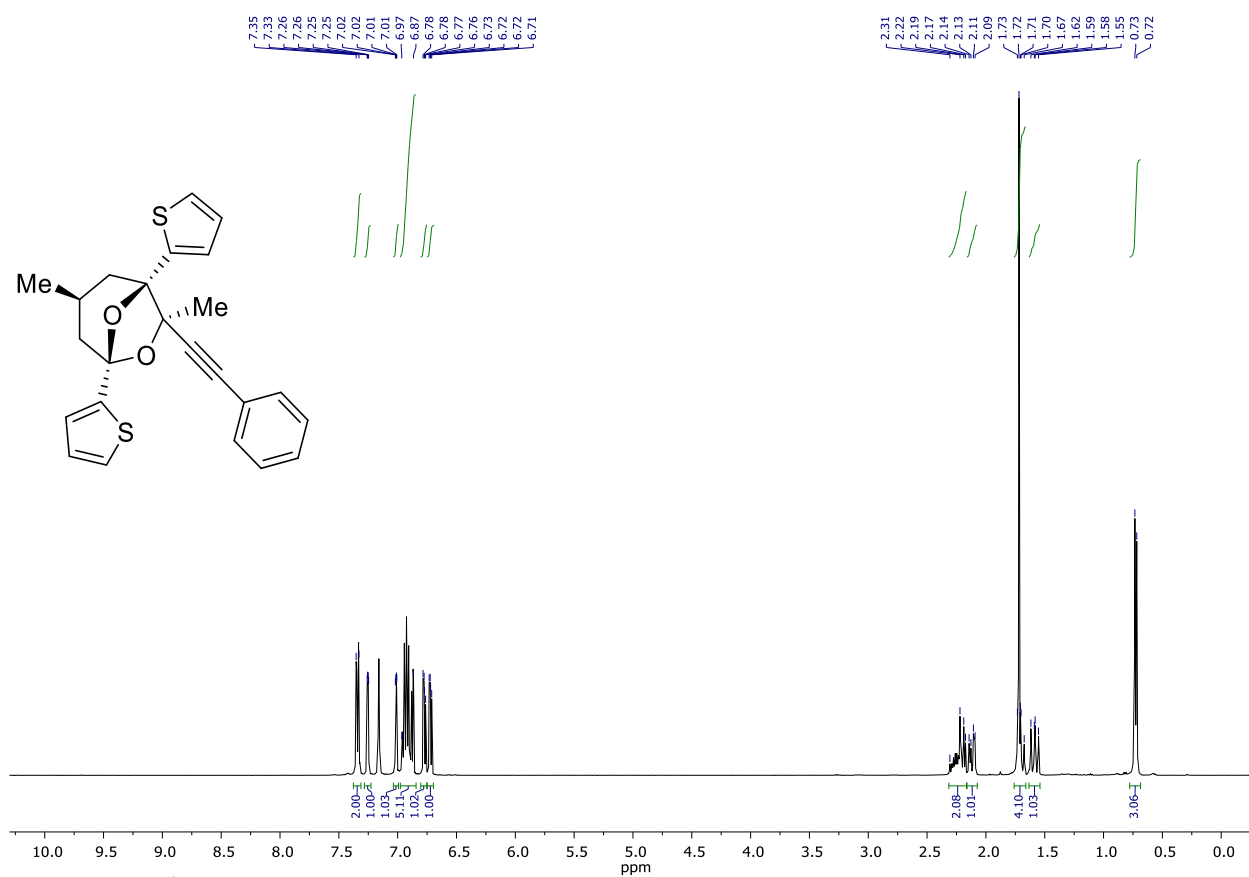
¹H NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5eb (400.1 MHz, benzene-d₆)**

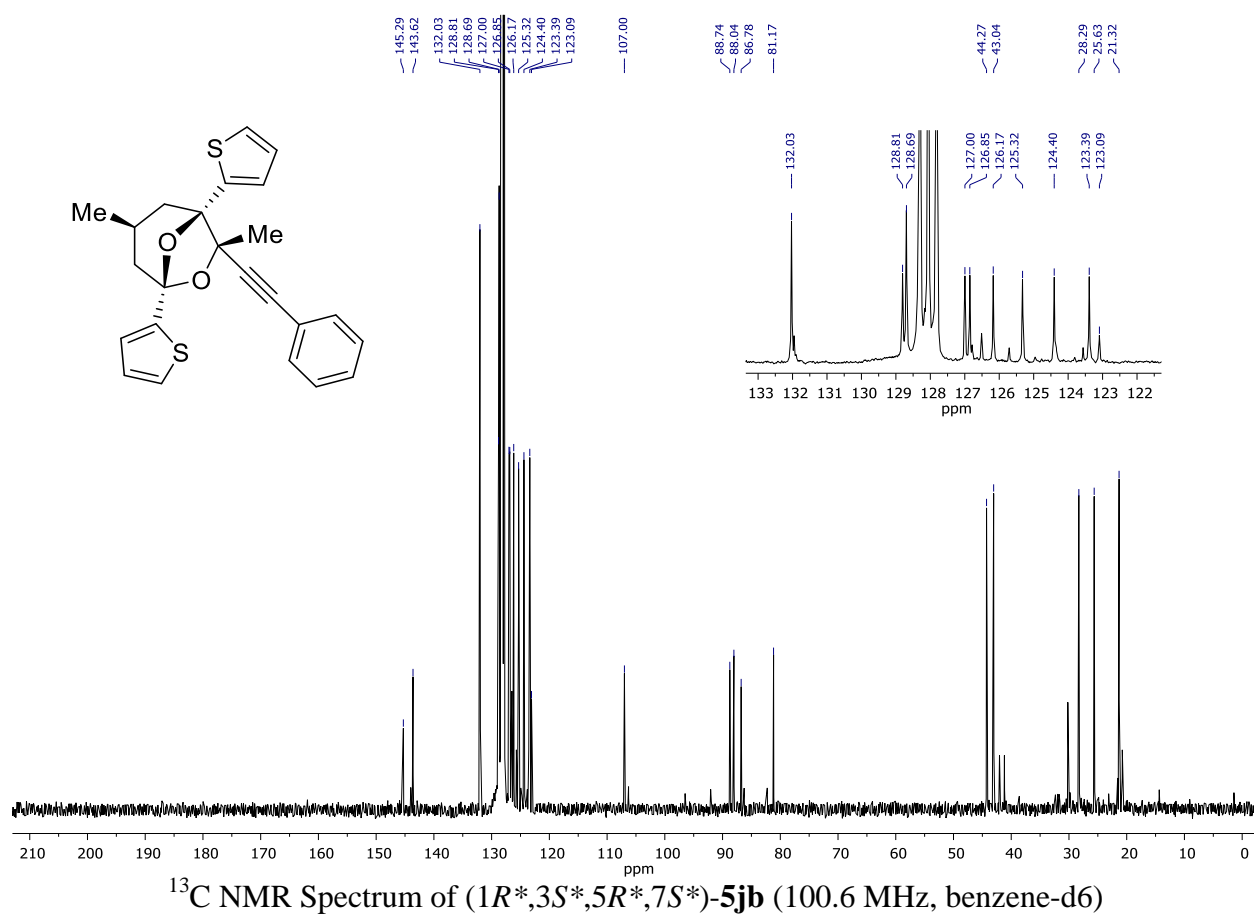
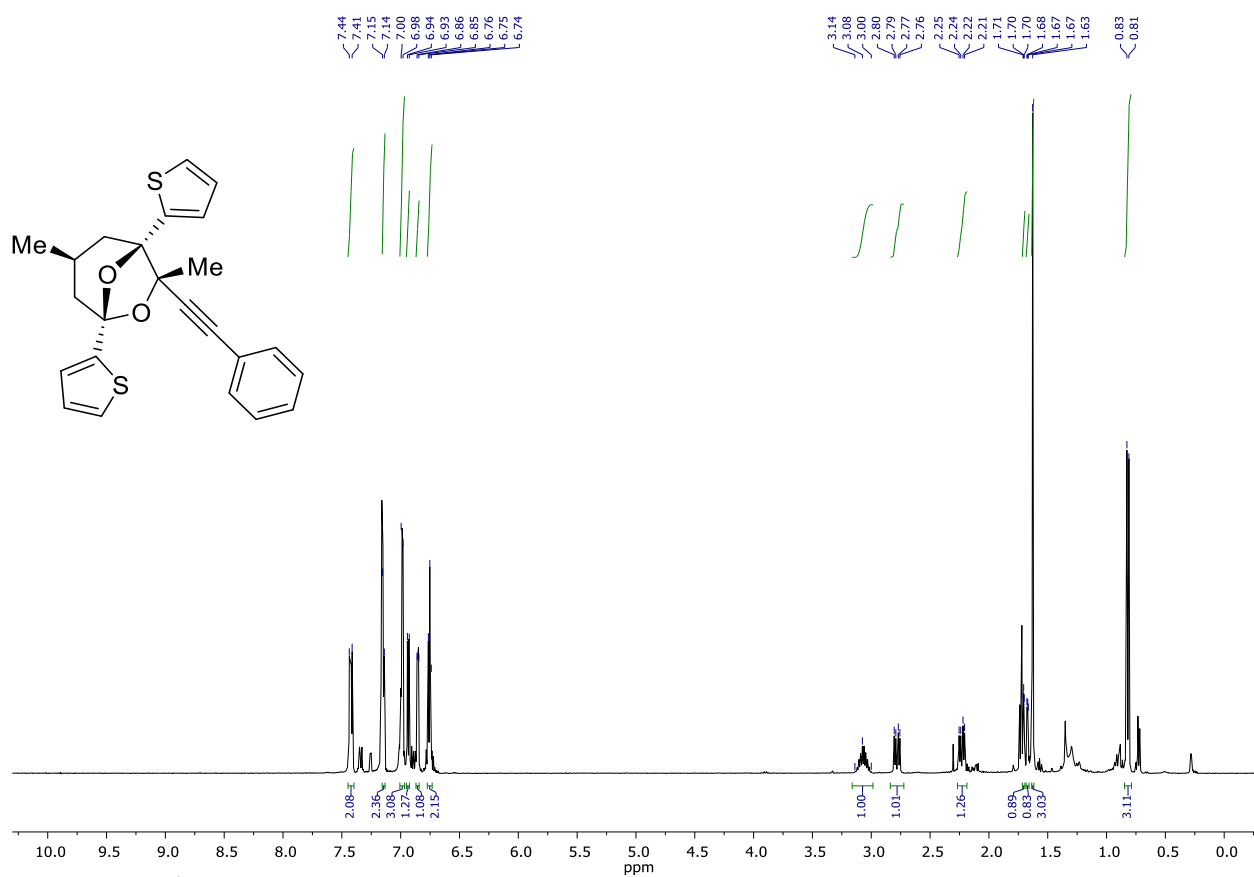


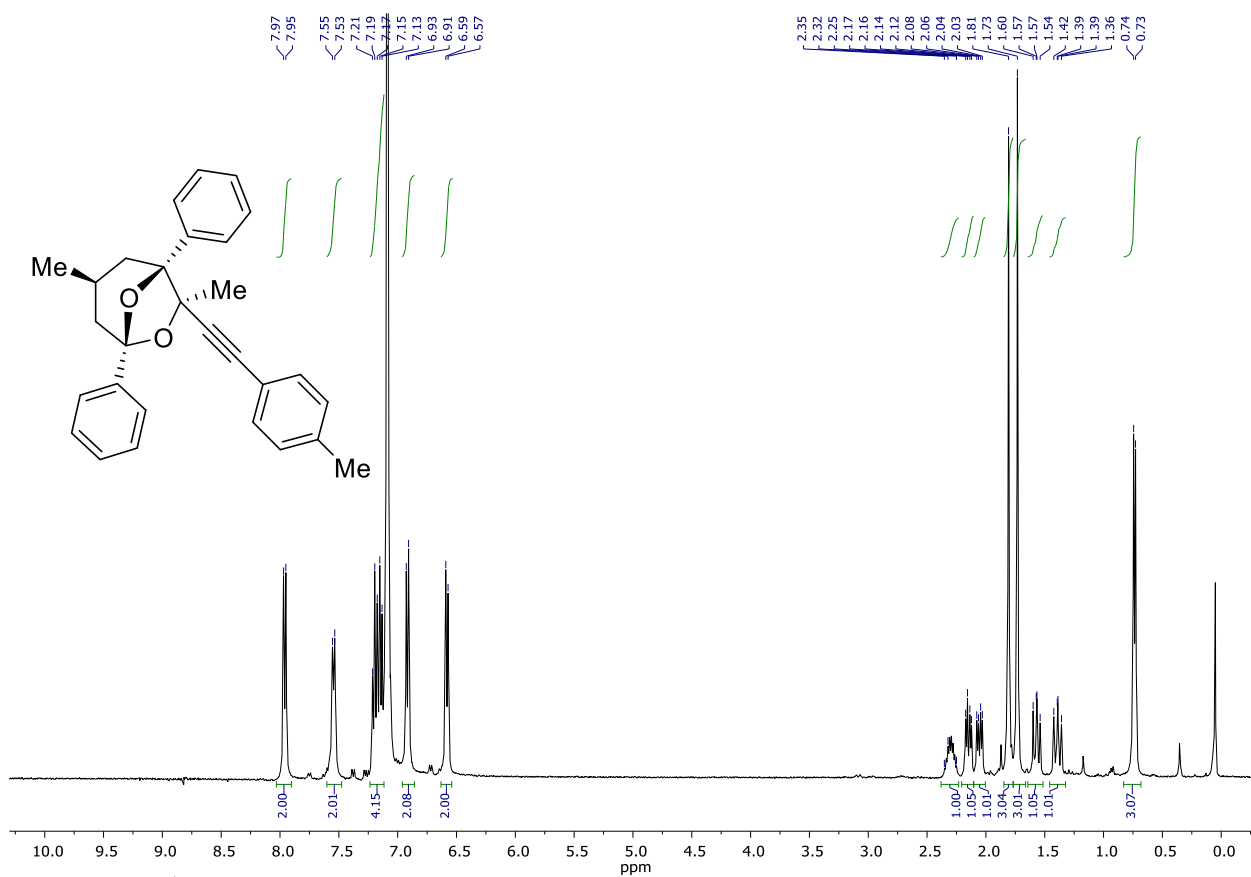
¹³C NMR Spectrum of (1*S,3*S**,5*R**,7*S**)-5eb (100.6 MHz, benzene-d₆)**



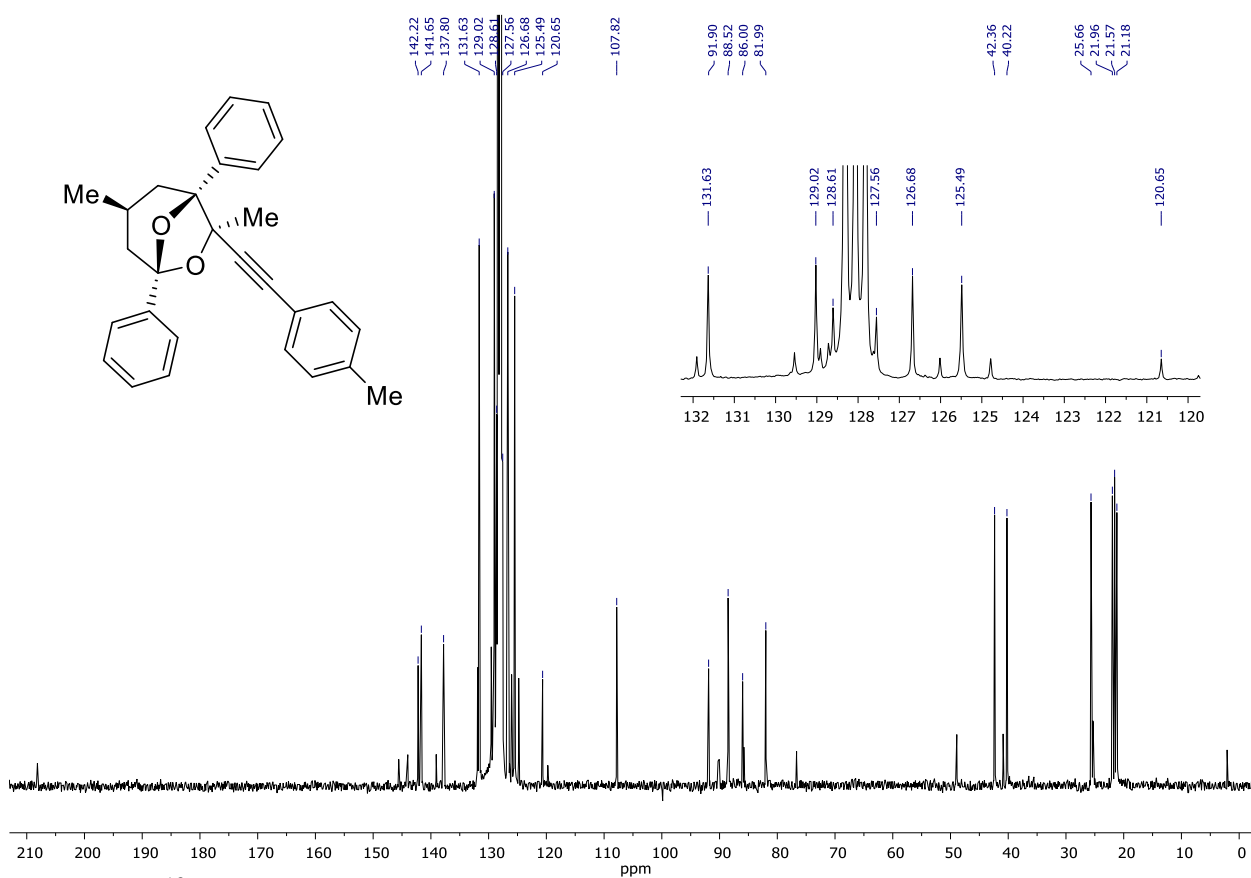








¹H NMR Spectrum of (1*S,3*S**,5*R**,7*R**)-5ac (400.1 MHz, benzene-d₆)**



¹³C NMR Spectrum of (1*S,3*S**,5*R**,7*R**)-5ac (100.6 MHz, benzene-d₆)**

